

Curriculum Vitae of Gitta Kutyniok

Contact and Personal Data

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Educational Background

Sept. 1978 – July 1982 Weerth-Schule in Detmold
Sept. 1982 – July 1991 Stadtgymnasium in Detmold
May 1991 Abitur
Oct. 1991 – March 1996 Studies in Mathematics and Computer Science, Universität Paderborn
March 1996 Diploma in Mathematics and Computer Science, Universität Paderborn

Employment History

April 1996 – July 2001 Wissenschaftliche Assistentin (*Scientific Assistant*), Universität Paderborn
Nov. 2000 Dr.rer.nat. in Mathematics, Universität Paderborn
Aug. 2001 – Dec. 2001 Visiting Assistant Professor, Georgia Institute of Technology, Atlanta, USA
Jan. 2002 – March 2004 Wissenschaftliche Assistentin (*Scientific Assistant*), Universität Paderborn
April 2004 – Sept. 2004 Wissenschaftliche Assistentin (*Scientific Assistant*), Justus-Liebig-Universität Giessen
Oct. 2004 – March 2005 Fellowship holder of the German Research Foundation, Washington University in St. Louis, USA
April 2005 – Sept. 2005 Fellowship holder of the German Research Foundation, Georgia Institute of Technology, Atlanta, USA
Oct. 2005 – March 2007 Wissenschaftliche Assistentin (*Scientific Assistant*), Justus-Liebig-Universität Giessen
Juni 2006 Habilitation in Mathematics, Justus-Liebig-Universität Giessen
April 2007 – Sept. 2007 Heisenberg-Fellow of the German Research Foundation, Princeton University, USA
Oct. 2007 – March 2008 Heisenberg-Fellow of the German Research Foundation, Stanford University, USA

April 2008 – Sept. 2008	Heisenberg-Fellow of the German Research Foundation, Yale University, USA
Oct. 2008 – Sept. 2011	Full Professor for Applied Analysis, Universität Osnabrück, and Head of the Applied Analysis Group (AAG)
Oct. 2011 – Sept. 2020	Einstein-Chair in Mathematics at the Technische Universität Berlin
Sept. 2014 – Dec. 2014	Visiting Professorship at the ETH Zürich
May 2018 – Sept. 2020	Professor of Computer Science and Electrical Engineering (by courtesy) at the Technische Universität Berlin
Since May 2019	Adjunct Professor in Machine Learning at the University of Tromsø
Since Oct. 2020	Bavarian AI Chair for Mathematical Foundations of Artificial Intelligence at the Ludwig-Maximilians-Universität München
Since May 2024	Consultant for the DLR – German Aerospace Center

Media

A selection of media coverage, including articles and interviews related to my research, is available at <https://www.ai.math.uni-muenchen.de/awards>.

Honors and Awards

- 1998 Weierstraß Preis des Fachbereichs Mathematik/Informatik der Universität Paderborn für hervorragende Lehre
(*Weierstraß Prize for outstanding teaching of the University of Paderborn*)
- 2003 Forschungspreis der Universität Paderborn
(*Research Prize of the University of Paderborn*)
- 2006 Preis der Justus–Liebig–Universität Gießen
(*Prize of the University of Gießen*)
- 2006 Heisenberg–Stipendium der DFG
(*Heisenberg–Fellowship of the German Research Foundation*)
- 2007 von Kaven–Ehrenpreis der DFG
(*von Kaven Prize of the German Research Foundation*)
- 2011 Einstein Chair at the Technische Universität Berlin
- 2013 Miller’s Scholar, University of Missouri, Columbia
- 2013 Noether Lecturer at the ÖMG-DMV-Kongress 2013 in Innsbruck
- 2014 Visiting Professorship (Nachdiplomlecturer), ETH Zürich
- 2015 J. Tinsley Oden Faculty Fellow, University of Texas at Austin
- 2016 Hans Schneider ILAS Lecturer at IWOTA 2016 in St. Louis
- 2016 Elected Member of the Berlin-Brandenburg Academy of Sciences and Humanities (BBAW)
- 2017 Offer of Full Professor “Applied Mathematics”, RWTH Aachen
- 2018 Offer of Full Professor “Applied Mathematics”, University of Paderborn
- 2019 SIAM Fellow

2019 Offer Adjunct Professor “Machine Learning”, University of Tromsø
 2020 Offer of Chair “Mathematical Aspects of Data Science”, University of Warwick
 2020 Offer of Full Professor for Mathematics, Johns Hopkins University
 2020 Francqui Chair, Belgium
 2020 International Conference on Machine Learning (ICML), Spotlight Paper
 2020 Bavarian AI Chair, LMU Munich
 2021 Simons Fellow, Isaac Newton Institute for Mathematical Sciences
 2021 Plenary Talk at the 8th European Congress of Mathematics in Portoroz, Slovenia
 2022 European Conference on Computer Vision (ECCV), Oral Presentation
 2022 Lecturer of the London Mathematical Society (LMS) Invited Lecture Series
 2022 Invited Lecture at the International Congress of Mathematics (ICM)
 2022 EURASIP Best Paper Award for Signal Processing: Image Communication Journal
 2022 Elected Member of the European Academy of Sciences (EurASc)
 2023 Lecturer in the Distinguished Lecture Series at UCLA
 2023 Invited Lecture at the International Congress on Industrial and Applied Mathematics (ICIAM)
 2024 Asia-Pacific Artificial Intelligence Association (AAIA) Fellow
 2024 Conference on Neural Information Processing Systems (NeurIPS), Oral Presentation
 2024 IEEE Fellow
 2025 Elected Member of the National Academy of Artificial Intelligence (NAAI)
 2025 Elected Member of Sigma Xi

Grants (with the most important ones being highlighted)

2006 – 2008 DAAD-Project “Complex and Harmonic Analysis for Time-Frequency Analysis (CHATIFA)” (313-PPP-N.07-lk) (PPP Germany-Norway) (joint with H. Führ, K. Gröchenig, and K. Seip)
 2008 – 2014 DFG-SPP-1324, KU 1446/13-1: “Numerical and harmonic analysis of problems with anisotropic features, directional representation systems and the solution of transport equations” (joint with W. Dahmen and C. Schwab)
 2010 – 2012 DFG Grant, KU 1446/14: “Multiscale representation systems for optimally sparse encoding and analysis of geometric features in 3-dimensional signals for both the continuous and digital setting”
 2011 – 2014 SFB-Project, SFB 944 Physiology and Dynamics of Cellular Microcompartments: “Mathematical Image Analysis and Processing” (canceled earlier due to move to TU Berlin)
 2012 – 2013 MATHEON-Project B26: “Information Extracting Sensor Networks”
 2013 – 2016 SFB-Project A10, SFB/TR 109 Discretization in Geometry and Dynamics: “Riemannian Manifold Learning via Shearlet Approximation”
 2013 – 2014 Extension of A10: “Shearlet Discretization and Imaging Science on Manifolds”
 2013 DFG-Conferences Support for “Compressed Sensing and its Applications”, December 2013, Berlin

- 2014 – 2016 ECMath Project CH2: “Sparse Compressed Sensing based Classifiers for -omics data” (joint with T. Conrad, C. Schütte, and J. Vybiral)
- 2014 – 2016 ECMath Project SE4: “Mathematical modeling, analysis and novel numerical concepts for anisotropic nanostructured materials” (joint with D. Knees, C. Kraus, and B. Wagner)
- 2015 – 2018 DFG-SPP-1798, KU 1446/23-1, Coordination of the DFG-Priority Programm “Compressed Sensing in Information Theory”, SPP 1798 (joint with R. Mathar)
- 2015 – 2016 DFG Projekt, KU 1446/18: “Discrete-Valued Sparse Signals – Theory, Algorithms, and Applications” (joint with R. Fischer and G. Pfander)
- 2015 – 2016 EXIST-Projekt “Teraki” (Compressed Sensing for Internet of Things) (Mentor; CEO D. Richart)
- 2015 – 2018 EU-FET-Project, “Data Learning on Manifolds and Future Challenges” (joint with CEA, FORTH, UCL, and SAGEM)
- 2015 DFG-Conferences Support for the 2. International MATHEON Conference on “Compressed Sensing and its Applications”, December 2015, Berlin
- 2015 – 2018 DFG-SPP-1798, KU 1446/21-1, “Compressive Sensing Algorithms for Structured Massive MIMO” (joint with G. Caire and G. Wunder)
- 2016 IMoS (“Interdisziplinäres Zentrum für Modellierung und Simulation”), 91b-Proposal to the Federal Government of Germany for a Research Building (as Co-PI)
- 2016 – 2020 SFB-Project C02, SFB/TR 109 Discretization in Geometry and Dynamics: “Digital representations of data on manifolds” (joint with F. Krahmer)
- 2016 – 2020 SFB-Project C03, SFB/TR 109 Discretization in Geometry and Dynamics: “Shearlet approximation of brittle fracture evolutions” (joint with M. Fornasier)
- 2017 – 2018 Extension of C03: “Quantization and Geometrically Structured High-Dimensional Functions”
- 2017 Gene Golub Summer School on “Data Sparse Approximations and Algorithms”, SIAM, June 2017, Berlin (joint with J. Liesen and V. Mehrmann)
- 2017 – 2018 ECMath Project CH14: “Understanding cell trajectories with sparse similarity learning” (joint with T. Conrad and C. Schütte)
- 2017 – 2021 GRK BIOQIC, Project 4 “Deep Learning for Quantitative Medical Imaging” (joint with T. Schaeffter)
- 2017 – 2021 GRK BIOQIC, Project 9 “Sparse Approximation with Anisotropic Systems for Quantitative Medical Imaging”
- 2018 – 2022 SFB-Project B07, SFB 1114 Scaling Cascades in Complex Systems: “Self-similar structures in turbulent flows and the construction of LES closures” (joint with R. Klein and V. Vercauteren)
- 2018 – 2023 **DFG-RTG DAEDALUS (Main PI)**
- 2018 – 2023 DFG-RTG DAEDALUS, Project P1 “Finding multiscale structures in high-dimensional data” (joint with K.-R. Müller and C. Schütte)
- 2018 – 2023 DFG-RTG DAEDALUS, Project P3 “Multiscale sparsity models” (joint with J. Eisert, F. Noé, and C. Schütte)
- 2018 – 2021 DFG-SPP-1798, KU 1446/27-2, Koordination des DFG-SPP “Compressed Sensing in der Informationsverarbeitung”, SPP 1798 (joint with R. Mathar)

- 2018 – 2021 DFG-SPP-1798, KU 1446/21-2, “Compressed Sensing Algorithms for Structured Massive MIMO (Phase II): From Massive MIMO to Massive Wireless Networks” (joint with G. Caire and G. Wunder)
- 2018 – 2022 Berlin Center for Maschine Learning (BZML) (joint with 20 PIs)
- 2018 – 2022 Berlin Center for Maschine Learning (BZML), Project AP4 “Multimodal Compressed Sensing”
- 2018 – 2025 MATH+ - The Berlin Mathematics Research Center (joint with 24 PIs)
- 2018 – 2021 MATH+ Project AA1x2, “Learning Transition Manifolds and Effective Dynamics of Biomolecules” (joint with P. Koltai, S. Klus, K.-R. Müller and C. Schütte)
- 2018 – 2021 MATH+ Project EF1x1, “Quantifying Uncertainties in Explainable AI” (joint with K.-R. Müller and W. Samek)
- 2018 – 2021 MATH+ Project EF1x4, “Extracting Dynamical Laws by Deep Neural Networks: A Theoretical Perspective” (joint with F. Noé and B. Zwicknagl)
- 2019 BMS Summer School 2019 on “Mathematics of Deep Learning”
- 2020 – 2023 BMBF-Project MaGrido, “Mathematik für maschinelle Lernmethoden für Graph-basierte Daten mit integriertem Domänenwissen” (joint with J. Garcke, J. Hamaekers, and D. Lorenz)
- 2021–2026 NSF-Simons Foundation-Collaborative Research Grant “Transferable, Hierarchical, Expressive, Optimal, Robust, and Interpretable NETWORKS (THEORINET)” (joint with 15 PIs)
- 2021 – 2025 SFB-Project C09, SFB/TR 109 Discretization in Geometry and Dynamics: “Deep Learning for Shape Reconstruction” (joint with D. Cremers)
- 2021 6-Month Programme “Mathematics of Deep Learning” at the Isaac Newton Institute for Mathematical Sciences (Main Organizer; joint with P. Bartlett, A. Hansen, A. Jentzen, and C. Schönlieb)
- 2021–2027 **DFG-SPP-2298 “Theoretical Foundations of Deep Learning” (Main PI)**
- 2021–2024 DFG-SPP-2298, KU 1446/31-1, Coordination of the DFG-Priority Programm “Theoretical Foundations of Deep Learning”
- 2021–2024 DFG-SPP-2298, KU 1446/32-1, Project “Deep-Learning basierte Regularisierung inverser Probleme” (joint with M. Burger)
- 2021–2023 Research Focus “Next Generation AI” at the Center for Advanced Studies (CAS) at LMU Munich (Spokesperson; joint with 7 colleagues)
- 2021–2024 **ONE Munich Strategy Forum Project “Next generation Human-Centered Robotics: Human embodiment and system agency in trustworthy AI for the Future of Health” (Spokesperson joint with S. Haddadin; 14 additional PIs)**
- 2022–2024 Research Focus “Physics and Security” at the Center for Advanced Studies (CAS) at LMU Munich (Member of the Core Team)
- 2022–2028 **Konrad Zuse School of Excellence in Reliable AI (relAI) (LMU-Director, joint with S. Günnemann as Director on TUM-side)**
- 2023–2024 Seed Funding for LMU-TAU Research Cooperation Program (joint with R. Giryes)
- 2024–2027 **Bayern-Sachsen Projekt “Next Generation AI Computing (gAIIn)” of the Bavarian and Saxonian State Ministries for Science (Main PI; joint with H. Boche, F. Fitzek, S. Speidel)**

- 2024–2027 BMBF Projekt GeniusRobot “Multi-Modal Generative Models with Interpretability for Robust Robotic Manipulation” (joint with W. Burgart, R. Calandra, B. Ommer)
- 2025–2026 **Research Project within the AI Act Accelerator of the Bavarian State Ministry for Digitalization (Main PI; joint with H. Boche, W. Burgart, S. Günnemann, L. Hornischer, M. Zöller)**
- 2025–2028 DFG-SPP-2298, KU 1446/31-2, Coordination of the DFG-Priority Programm “Theoretical Foundations of Deep Learning”
- 2025–2028 DFG-SPP-2298, KU 1446/38-1, Project “Spiking Neural Networks” (joint with H. Boche)
- 2025–2028 KMU-Innovativ-Projekt with Vivascope “Development of an AI-supported confocal laser scanning microscope for intraoperative tissue analysis during open surgery (CONFORM)” (joint with Vivascope, LMUKlinikum (A. Frank))

Entrepreneurial Activities

- 2023 Founding of Ecologic Computing GmbH

Patents

- 2013 “A System for Details Synthesis in Image Upsampling” (joint with H. Lakshman, H. Schwarz, D. Marpe, T. Wiegand, and W.-Q Lim), Japanese Patent, FhG Code HHI 2 - 2013FS4151; Indian Patent, IN Patent 396935.
- 2014 “Upsampling and Image Enhancement” (joint with H. Lakshman, H. Schwarz, D. Marpe, T. Wiegand, and W.-Q Lim), WO Patent Publication No. 14/173970 (April 23, 2014).

Invited Research Visits (of at least 1 week length)

2001

- Georgia Institute of Technology, Atlanta, Position as a Visiting Assistant Professor (5 months).

2002

- University of Missouri, Columbia, Invitation by Prof. P. G. Casazza (1 month).
- Washington University, St. Louis, Invitation by Prof. G. L. Weiss (2 weeks).

2003

- University of Arkansas, Fayetteville, Invitation by Prof. J. A. Hogan (1 week).
- Washington University, St. Louis, Invitation by Prof. G. L. Weiss (3 weeks).

2004

- Washington University, St. Louis, Invitation by Prof. G. L. Weiss (3 months).

2005

- Washington University, St. Louis, Invitation by Prof. G. L. Weiss (3 months).

- Georgia Institute of Technology, Atlanta, Invitation by Prof. C. Heil (6 months).
- University of Missouri, Columbia, Invitation by Prof. P. G. Casazza (1 week).
- Vanderbilt University, Nashville, Invitation by Prof. A. Aldroubi (1 week).

2006

- University of Missouri, Columbia, Invitation by Prof. P. G. Casazza (2 weeks).
- Universität Wien, Vienna, Invitation by Prof. H. G. Feichtinger (2 weeks).
- San Francisco State University, San Francisco, Invitation by Prof. S. Li (1 week).

2007

- University of South Carolina, Columbia, Invitation by Prof. W. Dahmen and Prof. P. Petrushev (1 week).
- Princeton University, Princeton, Invitation by Prof. I. Daubechies (6 months).
- Stanford University, Stanford, Invitation by Prof. D. L. Donoho (3 months).
- RWTH Aachen, Aachen, Invitation by Prof. W. Dahmen (1 week).
- Harvard University, Cambridge, Invitation by Prof. V. Tarokh (1 week).

2008

- Stanford University, Stanford, Invitation by Prof. D. L. Donoho (4 months).
- Yale University, New Haven, Invitation by Prof. R. Coifman (5 months).
- Princeton University, Princeton, Invitation by Prof. A. Pezeshki (1 week).
- Georgia Institute of Technology, Atlanta, Invitation by Prof. C. Heil (1 week).
- Cambridge University, Isaac Newton Institute for Mathematical Sciences, Programm “Statistical Theory and Methods for Complex, High-Dimensional Data”, Invitation by Prof. D. M. Titterton (1 month).
- University of South Carolina, Columbia, Invitation by Prof. W. Dahmen und Prof. P. Petrushev (1 week).
- Institute for Mathematical Sciences, National University of Singapore, Invitation by Prof. Z. Shen (1 week).

2009

- Colorado State University, Fort Collins, Invitation by Prof. A. Pezeshki (1 week).
- National University of Singapore, Singapore, Invitation by Prof. Z. Shen (1 week).
- University of Missouri, Columbia, Invitation by Prof. P. G. Casazza (1 week).
- Renaissance Technologies, East Setauket, Invitation by Prof. D. L. Donoho (1 month).
- Stony Brook University, Stony Brook, Invitation by Prof. D. Geller (1 month).
- University of Houston, Houston, Invitation by Prof. B. G. Bodmann and Prof. D. Labate (1 week).
- Oxford University, Oxford, Invitation by Prof. R. Hauser (1 week).

2010

- KAUST (King Abdullah University of Science and Technology), Jeddah, Invitation by Prof. Helmut Pottmann and Dr. Grohs (1 week).
- Vanderbilt University, Nashville, Invitation by Prof. A. Aldroubi (1 week).
- University of Heidelberg, Invitation by Prof. M. Leinert (2 weeks).
- University of Houston, Houston, Invitation by Prof. B. G. Bodmann and Prof. D. Labate (1 weeks).
- University of South Carolina, Columbia, Invitation by Prof. W. Dahmen und Prof. P. Petrushev (1 week).
- Princeton University, Princeton, Invitation by Prof. R. Calderbank and Prof. A. Pezeshki (1 week).
- Stanford University, Stanford, Invitation by Prof. D. L. Donoho (1 week).

- Colorado State University, Fort Collins, Invitation by Prof. A. Pezeshki (1 week).
- Stanford University, Stanford, Invitation by Prof. B. Rajaratnam (1 week).
- University of Missouri, Columbia, Invitation by Prof. P. G. Casazza (1 week).

2011

- University of Newcastle, Invitation by Prof. J. Hogan (1 week).
- Duke University, Invitation by Prof. M. Maggioni (1 week).
- Yale University, Invitation by Prof. R. Coifman (1 week).
- Colorado State University, Fort Collins, Invitation by Prof. A. Pezeshki (1 week).
- Stanford University, Stanford, Invitation by Prof. B. Rajaratnam (2 weeks).

2012

- University of Missouri, Columbia, Invitation by Prof. P. G. Casazza (2 weeks).
- Tel Aviv University, Invitation by Prof. A. Averbuch (1 week).
- Stanford University, Invitation by Prof. E. Candès (2 months).
- University of Houston, Invitation by Prof. B. Bodmann (1 week).
- Harvard University, Invitation by Prof. Lu (1 week).

2013

- University of Missouri, Columbia, Invitation by Prof. P. G. Casazza as *Miller's Scholar* (2 weeks).
- University of South Carolina, Columbia, Invitation by Prof. P. Petrushev (1 week).
- ETH Zürich, Invitation by Prof. P. Grohs (1 week).
- Chinese Academy of Science, Beijing by Prof. Zhiqiang Xu (1 week).
- Stanford University, Invitation by Prof. E. Candès (1 week).

2014

- UCLA, Invitation by Prof. A. Bertozzi (1 week).
- ICERM Research Fellow, ICERM, Program “Network Science and Graph Algorithms” (2 weeks).
- ETH Zürich, Visiting Professorship (3 months).

2015

- Colorado State University, Fort Collins, Invitation by Prof. A. Pezeshki (1 week).
- University of Texas at Austin, Institute for Computational Engineering and Sciences (ICES), J. Tinsley Oden Faculty Fellow (2 weeks).
- Centre de Recherche INRIA Rennes, France, Invitation by Prof. R. Gribonval (1 week).

2016

- Hausdorff Institute, Bonn, Invited Participant of Trisemester Program on “Mathematics of Signal Processing” (2 weeks).
- University of Houston, Distinguished Visitors Program, Invitation by Prof. B. Bodmann and Prof. D. Labate (1 month).
- Colorado State University, Fort Collins, Invitation by Prof. A. Pezeshki (1 week).
- Universität Wien, Invitation by Prof. P. Grohs (1 month).

2017

- University of Texas at Austin, Institute for Computational Engineering and Sciences (ICES), Invitation by Prof. C. Bajaj (1 week).
- Stanford University, Invitation by Prof. E. Candès (3 weeks).
- University of Hawaii, Invitation by Prof. T. Hangelbröck (1 week).

- New York (Columbia University, Courant Institute, and Center for Data Science), Invitations by Prof. A. Badeira, Prof. S. Güntürk, and Prof. A. Maleki (1 week).
- University of California, San Diego, Invitation by Prof. R. Saab (1 week).

2018

- Erwin Schrödinger International Institute for Mathematics and Physics, Wien, Austria, Programm “Numerical Analysis of Complex PDE Models in the Sciences”, Invitation by Prof. A. Buffa, Prof. T. Y. Hou, Prof. J. M. Melenk, Prof. I. Perugia, and Prof. C. Schwab (2 weeks).

2019

- California Institute of Technology, Invitation by Prof. J. Tropp (1 week).
- Colorado State University, Fort Collins, Invitation by Prof. A. Pezeshki (1 week).
- University of South Carolina, Columbia, Einladung von Prof. W. Dahmen (1 Woche).
- Cambridge University, Isaac Newton Institute for Mathematical Sciences, UK, Programm “Approximation, sampling and compression in data science”, Invitation by Prof. A. Shadrin, Prof. A. Hansen, Prof. V. Temlyakov and Prof. S. Tikhonov (1 month).

2020

- Institute of Advanced Study, Princeton, Invitation by Prof. Dr. S. Arora (1 week).

2024

- UCLA, Los Angeles, Invitation by Prof. Dr. T. Tao (1 week).

2025

- FORTH Institute, Crete, Invitation by Prof. Dr. J.-L. Starck (1 week).

Invited Talks

1997

- Colloquium, GSF–Forschungszentrum für Umwelt und Gesundheit, München, 7.10.1997.

1999

- Colloquium, GSF–Forschungszentrum für Umwelt und Gesundheit, München, 23.7.1999.

2000

- Graduate-Colloquium, TU München, 18.12.2000.

2001

- Colloquium, Universität zu Lübeck, 25.6.2001.
- Analysis Seminar, Georgia Institute of Technology, Atlanta, 28.11.2001.

2002

- Conference on “Frames, Wavelets, and Operator Theory”, Texas A&M University, 15.7.–19.7.2002.

2003

- AMS National Meeting, Baltimore, 15.1.–18.1.2003.
- Workshop on “Wavelets, Frames, and Operator Theory”, University of Maryland, 19.1.–21.1.2003.
- Analysis Seminar, University of Arkansas, Fayetteville, 23.1.2003.
- Colloquium, University of Arkansas, Fayetteville, 23.1.2003.

- International Symposium on Optical Science and Technology, SPIE's 48th Annual Meeting, Conference "Wavelets X", San Diego, 3.8.–8.8.2003.
- 25. Nordwestdeutsches Funktionalanalysis-Kolloquium, Universität Duisburg–Essen, Campus Essen, 8.11.2003.

2004

- Oberwolfach–Mini–Workshop "Wavelets and Frames", Mathematisches Forschungsinstitut Oberwolfach, 15.2.–21.2.2004.
- "Second International Conference of Computational Harmonic Analysis", Vanderbilt University, Nashville, 24.–30.5.2004.
- Seminar "Approximationstheorie und Numerik", Philipps–Universität Marburg, 3.6.2004.
- Wavelet Seminar, Washington University in St. Louis, St. Louis, 12.11.2004.

2005

- Analysis Seminar, University of Arkansas, Fayetteville, 17.2.2005.
- Colloquium, University of Arkansas, Fayetteville, 17.2.2005.
- Analysis Seminar, Washington University in St. Louis, St. Louis, 23.2.2005.
- Computational Analysis Seminar, Vanderbilt University, Nashville, 29.3.2005.
- Analysis Seminar, Georgia Institute of Technology, Atlanta, 13.4.2005.
- CSCAMM-Workshop "Sparse Representation in Redundant Systems", University of Maryland, College Park, 9.5.–13.5.2005.
- (2 Invited Talks) International Symposium on Optical Science and Technology, SPIE's 50th Annual Meeting auf der Konferenz "Wavelets XI", San Diego, 31.7.–4.8.2005.
- Banff–Workshop "Time-Frequency-Analysis and Non-Stationary Filtering", Banff International Research Station, 24.9.–29.9.2005.

2006

- Symposium about Applied Mathematics, Universität Zürich, Zürich, 23.1.2006.
- Oberseminar "Wissenschaftliches Rechnen und Modellbildung", TU München, München, 30.1.2006.
- Analysis Seminar, University of Missouri, Columbia, 28.2.2006.
- Wavelet Seminar, Washington University, St. Louis, 10.3.2006.
- Banff–Workshop "Coarsely Quantized Redundant Representations of Signals", Banff International Research Station, 11.3.–16.3.2006.
- NuHAG Seminar, Universität Wien, Wien, 27.3.2006.
- Colloquium, Justus-Liebig-University Gießen, 7.7.2006.
- Deutsches EEG/EP Mapping Meeting, Workshop über Wavelet-Analyse, Schloss Rauischholzhausen, 20.10.–22.10.2006.
- Workshop "The Kadison-Singer Problem", American Institute of Mathematics, Palo Alto, 25.9.–29.9.2006.
- Seminar, San Francisco State University, San Francisco, 5.10.2006.
- Oberseminar "Aktuelle Themen aus der Numerik", RWTH Aachen, 9.11.2006.
- Seminar "Angewandte Mathematik", Universität Potsdam, 14.11.2006.
- Oberseminar Marburg–Gießen "Approximationstheorie, Numerik und Optimierung", Universität Marburg, 28.11.2006.
- Rhein-Ruhr Seminar, Universität Duisburg-Essen, 1.12.2006.

2007

- Colloquium, GSF-Forschungszentrum für Umwelt und Gesundheit, Munich, 31.1.2007.
- (2 Invited Talks) Twelfth International Conference on Approximation Theory, San Antonio, Texas, 4.3.–8.3.2007.

- IMI Seminar, University of South Carolina, 12.3.2007.
- Norbert Wiener Center Seminar, University of Maryland, 19.4.2007.
- 2007 von Neumann "Symposium on Sparse Representations and High-Dimensional Geometry", Snowbird, Utah, 8.7.–12.7.2007.
- Oberwolfach-Workshop "Wavelet and Multiscale Methods", Mathematisches Forschungsinstitut Oberwolfach, 29.7.–4.8.2007.
- Brown Bag-Seminar, PACM, Princeton University, 22.8.2007.
- International Symposium on Optical Science and Technology, SPIE's 52th Annual Meeting, Conference "Wavelets XII", San Diego, 26.8.–30.8.2007.
- Banff-Workshop "Trends in Applied Harmonic Analysis", Banff International Research Station, 23.9.–28.9.2007.
- Applied Math Seminar, Stanford University, 9.11.2007.
- SAM Colloquium, ETH Zurich, 14.11.2007.
- Oberseminar "Aktuelle Themen aus der Numerik", RWTH Aachen, 22.11.2006.
- Colloquium, Universität Osnabrück, 23.11.2006.
- EE Seminar, Harvard University, 30.11.2007.
- Seminar, University of British Columbia, 12.12.2007.

2008

- (Poster) Workshop "Contemporary Frontiers in High-Dimensional Statistical Data Analysis", Isaac Newton Institute for Mathematical Sciences, Cambridge, UK, 7.1.–11.1.2008.
- Linear Algebra & Optimization-Seminar, Stanford University, 6.2.2008.
- Net/Comm/DSP Seminar, University of California, Berkeley, 11.2.2008.
- Conference on Information Sciences and Systems (CISS 2008), Princeton University, 19.3.–21.3.2008.
- Workshop on "Sparsity in High Dimensional Statistics and Learning Theory", Georgia Institute of Technology, 22.3.–24.3.2008.
- Analysis Seminar, Georgia Institute of Technology, 26.3.2008.
- IMI Seminar, University of South Carolina, 31.3.2008.
- Colloquium, Drexel University, 3.4.2008.
- Statistics Seminar, Stanford University, 6.5.2008.
- Colloquium, San Francisco State University, 7.5.2008.
- Applied Math Seminar, University of California, Davis, 8.5.2008.
- Workshop on "Nonlinear Approximation Techniques Using ℓ_1 ", Texas A&M University, 16.5.–18.5.2008.
- Applied Math Seminar, Yale University, 20.5.2008.
- Chinese-French-Singaporean Joint Workshop on "Wavelet Theory and Applications", Singapore, 9.6.–13.6.2008.
- 7th Conference on "Mathematical Methods for Curves and Surfaces", Toensberg, Norway, 26.6.–1.7.2008.
- Workshop "Frames for the finite world: Sampling, coding and quantization", American Institute of Mathematics, Palo Alto, 18.8.–22.8.2008.
- Alumni Meeting, Universität Osnabrück, 29.11.2008.
- Dagstuhl-Seminar "Structured Decompositions and Efficient Algorithms", Schloß Dagstuhl, Leibniz Zentrum für Informatik, 30.11.–5.12.2008.
- Talk Series "Jahr der Mathematik", Universität Osnabrück, 16.12.2008.
- Colloquium, Universität Münster, 18.12.2008.

2009

- Meeting of FNRS Contact Group "Wavelets and applications", Brussels, 19.1.2009.
- Tag der Berufspraxis, Universität Bielefeld, 23.1.2009.

- Neurobiology Departmental Seminar, Universität Osnabrück, 3.3.2009.
- Banff-Workshop “Frames from First Principles”, Banff International Research Station, 16.3.–20.3.2009.
- Mathematics-Electrical Engineering Seminar, Colorado State University, 24.3.2009.
- Colloquium, Universität Paderborn, 28.5.2009.
- Colloquium in Applied Mathematics, Universität Münster, 6.5.2009.
- (2 Invited Talks) SampTA09, CIRM, Marseille, 18.5.–22.5.2009.
- Conference “Strobl09”, Strobl, Austria, 15.6.–19.6.2009.
- SFB-Colloquium, Universität Bonn, 7.7.2009.
- Seminar, Universität des Saarlandes, 10.7.2009.
- Mathematics-Electrical Engineering Seminar, Nanyang Technological University, 24.7.2009.
- (2 Invited Talks) International Symposium on Optical Science and Technology, SPIE’s 54th Annual Meeting, Conference “Wavelets XIII”, San Diego, 2.8.–6.8.2009.
- Colloquium, Stony Brook University, 3.9.2009.
- Analysis Seminar, Stony Brook University, 8.9.2009.
- Analysis Seminar, University of Houston, 5.10.2009.
- Computational Mathematics and Applications Seminar, Oxford University, 15.10.2009.
- Antrittsvorlesung, Universität Osnabrück, 13.11.2009.
- Colloquium, Institute of Biomathematics and Biometry, Helmholtz Zentrum München, 25.11.2009.
- Colloquium on Applied Mathematics, Universität Hamburg, 26.11.2009.

2010

- AMS National Meeting, San Francisco, 13.1.–16.1.2010.
- Satellite Conference of the AMS Meeting, Workshop on “Optimal Frames and Operator Algebras”, San Francisco State University, 17.1.–19.1.2010.
- Applied Mathematics Seminar, KAUST, 14.2.2010.
- IMI Seminar, University of South Carolina, 3.3.2010.
- 13th International Conference on Approximation Theory, San Antonio, 7.3.–10.3.2010.
- Analysis Seminar, University of Houston, 9.10.2009.
- Conference on Information Sciences and Systems (CISS 2010), Princeton University, 17.3.–29.3.2010.
- (2 Invited Talks) Interdisciplinary Workshop on “Sparsity and Modern Mathematical Methods for High Dimensional Data”, Brussels, Belgium, 6.4.–10.4.2010.
- SIAM Conference on Imaging Science (IS10), Chicago, 12.4.–14.4.2010.
- Seminar, Universität Münster, 28.4.2010.
- Colloquium, Universität Frankfurt, 7.5.2010.
- Conference in Honor of Pete Casazza’s 65th Birthday, “From Banach Spaces to Frame Theory and Applications”, University of Maryland, 20.5.–23.5.2010.
- Colloquium, Universität Oldenburg, 2.6.2010.
- Workshop “Sparsity and Computation”, Universität Bonn, 7.6.–11.6.2010.
- Conference Noko 2010, Universität Oldenburg, 12.6.2010.
- (2 Invited Talks) Seventh International Conference on Curves and Surfaces, Avignon, France, 24.6.–30.6.2010.
- Conference “New Trends in Harmonic and Complex Analysis”, Bremen, 29.6.–3.7.2010.
- Seminar, TU Berlin, 9.7.2010.
- Oberwolfach-Workshop “Wavelet and Multiscale Methods”, Mathematisches Forschungsinstitut Oberwolfach, 1.8.–7.8.2010.
- ECE Seminar, Rice University, 14.9.2010.
- Colloquium, San Francisco State University, 17.9.2010.

- Oberwolfach-Mini-Workshop “Shearlets”, Mathematisches Forschungsinstitut Oberwolfach, 4.10.–8.10.2010.
- Illinois/Missouri Applied Harmonic Analysis Seminar, University of Illinois, 16.10.2010.
- Colloquium, Jacobs-University Bremen, 8.11.2010.
- Conference of the Canadian Mathematical Society in Vancouver, Canada, 4.12.–6.12.2010.

2011

- Keynote Talk, International Conference on Harmonic Analysis and Applications, Sydney, 7.2.–11.2.2011.
- Kolloquium, University of Newcastle, Newcastle, 14.2.2011.
- Workshop “New Frontiers in Imaging and Sensing”, University of South Carolina, 17.2.–23.2.2011.
- Analysis Seminar, Duke University, 28.2.2011.
- Analysis Seminar, Yale University, 15.3.2011.
- Invited Survey Talk, 82nd Annual Meeting of the International Association of Applied Mathematics (GAMM), Graz University of Technology, 18.4.–21.4.2011.
- 82nd Annual Meeting of the International Association of Applied Mathematics, Graz University of Technology, 18.4.–21.4.2011.
- SampTA 2011, Nanyang Technological University, Singapore, 2.5.–6.5.2011.
- International Symposium in Approximation Theory, Vanderbilt University, 17.5.–21.5.2011.
- Keynote Talk, International Conference on Applied Harmonic Analysis and Multiscale Computing, Edmonton, Canada, 25.7.–28.7.2011.
- Mathematics-Electrical Engineering Seminar, Colorado State University, 29.7.2011.
- Colloquium, University of Colorado, 5.8.2011.
- (3 Invited Talks) International Symposium on Optical Science and Technology, SPIE’s 54th Annual Meeting, Conference “Wavelets and Sparsity XIV”, San Diego, 21.8.–25.8.2011.
- ILAS 2011, TU Braunschweig, Germany, 22.8.–26.8.2011.
- Plenary Talk, International Conference on Multivariate Approximation, Hagen, Germany, 24.9.–27.9.2011.
- Plenary Talk, International Workshop on Wavelets, Frames and Applications, University of Delhi, India, 15.12.–21.12.2011.

2012

- Berlin Mathematical School, 6.1.2012.
- CosmoStat Seminar, CEA-Saclay, Gif-sur-Yvette, France, 13.1.2012.
- Plenary Talk, Conference “Mathematics and Image Analysis 2012”, Paris, 16.1.–18.1.2012.
- Antrittsvorlesung, TU Berlin, 17.2.2012.
- Analysis Seminar, University of Missouri, 21.2.2012.
- Colloquium, University of Missouri, 23.2.2012.
- Analysis Seminar, Tel Aviv University, 6.3.2012.
- EE Seminar, Technion, 7.3.2012.
- EE Seminar, EPFL, 19.3.2012.
- (2 Invited Talks) 83rd Annual Meeting of the International Association of Applied Mathematics (GAMM), Universität Darmstadt, 26.3.–30.3.2012.
- Tag der Mathematik, Berlin, 5.5.2012.
- Treffen mit dem Wissenschaftlichen MATHEON-Beirats, 11.5.2012.
- Schüler-Info-Tage TU Berlin, 15.5.2012.
- (2 Invited Talks) SIAM Conference on Imaging Science, Philadelphia, 20.–22.5.2012.
- Colloquium, Universität Göttingen, 29.5.2012.
- Applied and Computational Analysis Seminar, University of Cambridge, 31.5.2012.

- Oberwolfach-Workshop “Applied Harmonic Analysis and Sparse Approximation”, Mathematisches Forschungsinstitut Oberwolfach, 11.6.–15.6.2012.
- Oberwolfach-Workshop “Learning Theory and Approximation”, Mathematisches Forschungsinstitut Oberwolfach, 25.6.–29.6.2012.
- ISMP 2012, Berlin, 20.-24.8.2012.
- Seminar, Stanford University, 5.9.2012.
- Applied Mathematics Colloquium, California Institute of Technology, 10.9.2012.
- Mathematics-Electrical Engineering Seminar, Colorado State University, 25.9.2012.
- Harvard EE Seminar, Harvard University, 19.10.2012.
- PACM Colloquium, Princeton University, 22.10.2012.
- CSCAMM Seminar, University of Maryland, 24.10.2012.
- Analysis Seminar, University of Houston, 29.10.2012.
- ECE Seminar, Rice University, 1.11.2012.
- Public Einstein Lecture, 8.11.2012.
- Plenary Talk, International Workshop SIGMA’2012 (Signal-Image-Geometry-Modelling-Approximation), CIRM, 19.-23.11.2012.

2013

- MathInside, MATHEON, Berlin, 15.1.2013.
- Colloquium, Universität Dresden, 16.1.2013.
- Colloquium, University of Missouri, 14.2.2013.
- IMI Seminar, University of South Carolina, 19.3.2013.
- MathInside, MATHEON, Berlin, 15.3.2013.
- Colloquium, Seminar for Applied Mathematics (SAM), ETH Zürich, 27.3.2013.
- Plenary Talk, 14th International Conference on Approximation Theory, San Antonio, 7.-10.4.2013.
- Keynote Talk, 4. Data Science Day, Berlin, 25.4.2013.
- Numerical Analysis Seminar, Oxford University, 23.5.2013.
- Mathematical Colloquium, University of Darmstadt, 29.5.2013.
- ICMSEC Seminar, Chinese Academy of Science, Beijing, 5.6.2013.
- SPAWC 2013 (4th IEEE International Workshop on Signal Processing Advances for Wireless Communications), Darmstadt, 16.6.–19.6.2013.
- Series of Invited Lectures, SFB-BMS Sommer-School “Discrete Differential Geometry”, Berlin, 9.9.–20.9.2013.
- SampTA13, Bremen, Germany, 2.7.–5.7.2013.
- Plenary Talk, CIMPA 2013 “New Trends in Applied Harmonic Analysis: Sparse Representations, Compressed Sensing and Multifractal Analysis”, Mar del Plata, Argentina, 5.8.-16.8.2013.
- Mathematics-Electrical Engineering Seminar, Colorado State University, 22.8.2013.
- (2 Invited Talks) International Symposium on Optical Science and Technology, SPIE’s 56th Annual Meeting, Conference “Wavelets and Sparsity XV”, San Diego, 25.8.–29.8.2013.
- Geometry Workshop, Strobl, Austria, 28.8.-31.8.2013.
- Workshop of the GAMM activity group “Applied and Numerical Linear Algebra”, Universität Wuppertal, Germany, 9.9.–10.9.2013.
- Plenary Talk (*Noether Lecturer*), ÖMG-DMV-Kongress 2013, Innsbruck, 23.-26.9.2013.
- Minisymposium “Frames, high-dimensional data analysis, and dimension reduction”, ÖMG-DMV-Kongress 2013, Innsbruck, 23.-26.9.2013.
- Colloquium Talk, Universität Passau, 29.10.2013.
- Plenary Talk, Workshop “Statistical Issues in Compressive Sensing”, Universität Göttingen, Germany, 11.-13.11.2013.

- Colloquium Talk, University of Warwick, 29.11.2013.
- Distinguished Lecture Series, School of Computer and Communication Sciences, EPFL, 18.11.2013.

2014

- Conference on Numerical Analysis and Scientific Computing, MPI Leipzig, 7.1.–9.1.2014.
- Colloquium, UCLA, 22.1.2014.
- BMS Student Conference 2014, Berlin, 21.2.2014.
- Minisymposium “Linear Algebra in Compressed Sensing”, 85nd Annual Meeting of the International Association of Applied Mathematics (GAMM), Universität Erlangen, 10.3.–14.3.2014.
- Oberwolfach-Miniworkshop “Mathematical Physics meets Sparse Recovery”, Mathematisches Forschungsinstitut Oberwolfach, 14.4.–18.4.2014.
- (2 Invited Talks) SIAM Conference on Imaging Science (IS14), Hong Kong, 12.5.–14.5.2014.
- Department Seminar, City University of Hong Kong, 15.5.2014.
- Keynote Talk, Fifth International Conference on Computational Harmonic Analysis and Applications in conjunction with the Shanks Lecture series, Vanderbilt University, Nashville, 19.5.–23.5.2014.
- Invited Talk, Banff-Workshop “Imaging and Modeling in Electron Microscopy - Recent Advances”, Banff International Research Station, 18.5.–23.5.2014.
- Invited Lecture, Summer School on “Coherent state transforms, time-frequency and time-scale analysis, applications”, Trieste, Italy, 2.6.–21.6.2014.
- Colloquium, RWTH Aachen, 17.6.2014.
- Workshop “White nights of materials science: From physics and chemistry to data analysis, and back”, Saint Petersburg, Russia, 16.6.–20.6.2014.
- Royal Society International Scientific Seminar “Computations in infinite dimensions: challenges in a continuous world”, Kavli Royal Society International Centre, Chicheley Hall, UK, 30.6.–1.7.2014.
- Invited Talk, RIPS@Berlin, FU Berlin, 9.7.2014.
- Plenary Talk, 30th International Colloquium on Group Theoretical Methods in Physics (ICGTMP), Ghent University, Belgium, 14.7.–18.7.2014.
- Plenary Talk, UCL-Duke University Workshop on Sensing and Analysis of High-Dimensional Data, University College London, UK, 4.9.–5.9.2014.
- Colloquium, Zurich Colloquium in Applied and Computational Mathematics, ETH Zürich, 16.9.2014.
- Invited Talk Series, Summer School “Modelling”, Fraunhofer-Institut ITWM, Kaiserslautern, 20.10.–24.10.2014.
- Invited Talk, Berlin-Brandenburgische Akademie der Wissenschaften, 28.11.2014.
- Symposium on “Informatics and Genomics for Materials Development”, 2014 Fall Meeting of the Materials Research Society, Boston, 30.11.–5.12.2014.
- Plenary Talk, 5th International Conference on Scientific Computing and Partial Differential Equations (SCPDE14), Hong Kong Baptist University, Hong Kong, 8.12.–12.12.2014.
- Semi-Plenary Talk, Approximation Theory Workshop, FoCM2014, Montevideo, 11.12.–20.12.2014.

2015

- Urania, Berlin, 19.1.2015.
- Joint ECE-CS-IP Seminar, Colorado State University, 5.2.2015.
- Colloquium, University of Texas, Austin, 9.2.2015.
- Visualization Seminar, University of Texas, Austin, 10.2.2015.
- ICES Seminar, University of Texas, Austin, 12.2.2015.

- Visualization Seminar, University of Texas, Austin, 17.2.2015.
- Seminar, Centre de Recherche INRIA Rennes, France, 9.4.2015.
- Colloquium, University of Vienna, Vienna, 29.4.2015.
- Plenary Talk, Applied Inverse Problems Conference, Helsinki, Finland, 25.5.–29.5.2015.
- Plenary Talk, International Conference on “Applied Mathematics and Approximation Theory 2015” (AMAT 2015), Ankara, Turkey, 28.5.–31.5.2015.
- Colloquium of the Hausdorff Center for Mathematics, Universität Bonn, 10.6.2015.
- Invited Talk, Minisymposium “Compressed Sensing and Medical Applications”, 27th IFIP TC7 Conference 2015, Nice, France, 29.6.–3.7.2015.
- Invited Talk, International Geometry Workshop, Seggau, 10.7.–12.7.2015.
- Mini-Symposium on “Sparsity-promoting Seismic Data Analysis”, 8th International Congress on Industrial and Applied Mathematics (ICIAM 2015), Beijing, China, 10.8.–14.8.2015.
- Plenary Talk, Model Reduction of Parametrized Systems (MoRePaS) workshop, SISSA, International School for Advanced Studies, Trieste, Italy, 13.10.–16.10.2015.
- Colloquium, Universität Münster, 29.10.2015.
- AIM (Applied and Interdisciplinary Mathematics) Seminar, University of Michigan, 6.11.2015.

2016

- Colloquium, Physikalisch-Technische Bundesanstalt, Berlin, 3.2.2016.
- Invited Talk, Workshop “Harmonic Analysis, Graphs and Learning”, Hausdorff Institute, Bonn, 14.3.–18.3.2016.
- ECMath Colloquium, HU Berlin, 22.4.2016.
- Mathicse Colloquium, EPFL, 11.5.2016.
- Minitutorial Lecture, SIAM Conference on Imaging Science (IS16), Albuquerque, New Mexico, 23.5.–26.5.2016.
- Plenary Talk, International Conference on Modern Time-Frequency Analysis (Strobl’16), Strobl, Austria, 6.6.–10.6.2016.
- Plenary Talk, International Workshop on Operator Theory and Applications (IWOTA) 2016, St. Louis, Missouri, 18.7.–22.7.2016.
- 2 Invited Lectures, BMS Summer School “Mathematical and Numerical Methods in Image Processing”, Berlin, 25.7.–5.8.2016.
- Analysis Seminar, University of Houston, 16.9.2016.
- ECE Seminar, Rice University, 20.9.2016.
- Imaging Seminar, University of Houston, 26.9.2016.
- Colloquium, Georgia Institute of Technology, Atlanta, 29.9.2016.
- Analysis Seminar, Georgia Institute of Technology, Atlanta, 30.9.2016.
- Invited Talk, BIRS-Workshop “Applied Harmonic Analysis, Massive Data Sets, Machine Learning, and Signal Processing”, Oaxaca, Mexico, 17.10.–21.10.2016.
- Plenary Talk, International Workshop SIGMA’2016 (Signal-Image-Geometry-Modelling-Approximation), CIRM, 31.10.–4.11.2016.
- Plenary Talk, International Workshop on Coherent States and their Applications, CIRM, France, 14.11.–18.11.2016.
- Special Symposium on Intelligent Systems, Max Planck Institute for Intelligent Systems, Tübingen, 13.–14.12.2016.
- Christmas Colloquium, Justus-Liebig-Universität Gießen, 14.12.2016.

2017

- PDE and Applied Math Seminar, UC Davis, 8.2.2017.
- Seminar, Stanford University, 9.2.2017.
- Colloquium, University of Hawaii, 15.2.2017.
- Statistics & Electrical Engineering Seminar, Columbia University, 28.2.2017.

- Math and Data Seminar, Center for Data Science, New York University, 2.3.2017.
- Harmonic Analysis and Signal Processing (HASP) and Numerical Analysis and Scientific Computing (NASC) Seminar, Courant Institute, New York University, 3.3.2017.
- 88nd Annual Meeting of the International Association of Applied Mathematics (GAMM), Universität Weimar, 6.3.–10.3.2017.
- Oberwolfach-Workshop “Multiscale and High-Dimensional Problems”, Mathematisches Forschungsinstitut Oberwolfach, 26.3.–1.4.2017.
- Colloquium, Universität Darmstadt, 26.4.2017.
- SFB Seminar, TU Berlin, 16.5.2017.
- Plenary Talk, SPARS 2017, Lisbon, Portugal, 5.6.–8.6.2017.
- Plenary Talk, Conference of the European Women in Mathematics, German Chapter, Bielefeld, 9.6.–10.6.2017.
- Invited Talk, Deep Learning Workshop, Berlin, 25.6.–29.6.2017.
- Colloquium, TU Berlin, 27.6.2017.
- Plenary Talk, Jaen Conference on Approximation Theory, Computer Aided Geometric Design, Numerical Methods and Applications, Ubeda, Spain, 2.7.–7.7.2017.
- Invited Talk, Approximation Theory Workshop, FoCM2017, Barcelona, Spain, 10.7.–19.7.2017.
- Invited Talk, Computational Harmonic Analysis and Compressive Sensing Workshop, FoCM2017, Barcelona, Spain, 10.7.–19.7.2017.
- Invited Talk, International Symposium on Optical Science and Technology, SPIE’s 61th Annual Meeting, Conference “Wavelets and Sparsity XVII”, San Diego, 6.8.–10.8.2017.
- Invited Talk, Intelligent Data Analysis (IDA) Retreat, Berlin, 4.9.–5.9.2017.
- Plenary Talk, International Geometry Workshop in Obergurgl, Austria, 21.9.–26.9.2017.
- Invited Talk, BIRS-Workshop “Mathematical Advances in Electron Microscopy”, Oaxaca, Mexico, 15.10.–20.10.2017.
- Research Seminar “Mathematical Statistics”, Weierstrass-Institute for Applied Analysis and Stochastics, Berlin, 29.11.2017.
- Invited Talk, Newton-Institute-Workshop “Generative models, parameter learning and sparsity”, Cambridge, 30.10.–3.11.2017.
- Colloquium, Max-Planck-Institute for Mathematics in the Sciences, Leipzig, 19.12.2017.
- Colloquium, Universität Postdam, 20.12.2017.

2018

- Invited Talk, IAS Workshop “The Mathematics of Deep Learning”, Hong Kong, 8.1.–12.1.2018.
- Statistics Seminar, WIAS, Berlin, 7.2.2018.
- Keynote Talk, Technology Innovation Science Match, Berlin, 22.2.2018.
- Invited Talk, Oberwolfach-Mini-Workshop “Deep Learning and Inverse Problems”, Mathematisches Forschungsinstitut Oberwolfach, 4.3.–10.3.2018.
- Invited Talk, Workshop “Theory of Deep Learning”, DALI 2018 – Data Learning and Inference, Playa Blanca, Lanzarote, Canary Islands, 3.4.–5.4.2018.
- Tutorial Lecture on “Mathematics of Deep Neural Networks”, AIT Meeting of the Activity Group of ITG, TU Berlin, 3.5.–4.5.2018.
- Keynote Talk, Banff-Workshop “Numerical Analysis and Approximation Theory meets Data Science”, Banff International Research Station, 22.4.–28.4.2018.
- Invited Talk, Seventh International Conference on Computational Harmonic Analysis (ICCHA7), Nashville, 14.5.–18.5.2018.
- Plenary Talk, Conference “Big Data and Data Science for the Digital World”, Madrid, 4.6.–5.6.2018.

- (3 Invited Talks) SIAM Conference on Imaging Science (IS18), Bologna, 5.6.–8.6.2018.
- Panel Talk, Forward Looking Panel – Imaging Science in the Age of Machine Learning, SIAM IS18, Bologna, 5.6.–8.6.2018.
- Invited Talk, Hybrid Talks on “Simulation”, TU Berlin, 14.6.2018.
- Invited Talk, Seminar on “Methods of Algebra and Functional Analysis In Applications”, Czech Technical University, Prague, 25.6.2018.
- Invited Talk, Workshop on “Theory of Deep Learning”, 5th International Conference on Machine Learning (ICML 2018), Stockholm, Sweden, 10.7.–15.7.2018.
- Keynote Talk, Conference on Deep Learning: From Theory to Applications, Rennes, France, 4.9.–6.9.2018.
- Invited Talk, Geburtstagssymposium, Berlin-Brandenburgische Akademie der Wissenschaften, 10.9.2018.
- Invited Talk, Minisymposium “Frame Theory and Asymptotic Analysis”, European Women in Mathematics General Meeting 2018, Graz, Austria, 3.9.–7.9.2018.
- Plenary Talk, International Traveling Workshop for Interacting Sparse models and Technology (iTWIST Workshop), CIRM, France, 21.11.–23.11.2018.
- Invited Lecture, General Lecture Series “Digital Future”, Berlin, 27.11.2018.
- Invited Talk, Berliner Verbundprogramm DiGiTal, TU Berlin, Open Lab “Gleichstellung in der virtuellen Wirklichkeit”, Berlin, 27.11.2018.
- Invited Talk, Symposium on “Advances in Deep Learning”, ICSEE 2018 – International Conference on the Science of Electrical Engineering in Israel, Eilat, Israel, 12.12.–14.12.2018.

2019

- Keynote Talk, Northern Lights Deep Learning Workshop, Tromsø, Norway, 9.1.–10.1.2019.
- Invited Talk, International BASP Frontiers Workshop 2019 on Neural-nets in Imaging”, Villars-sur-Ollon, Switzerland, 3.2.–8.2.2019.
- Keynote Talk, Workshop “Big Data Science in Astroparticle Research”, RWTH Aachen, 19.2.2019.
- Invited Talk, Workshop on Compressed of Deep Neural Networks, Fraunhofer Heinrich-Hertz Institute, 25.2.2019.
- Colloquium Talk, California Institute of Technology, 5.3.2019.
- Seminar Talk, California Institute of Technology, 7.3.2019.
- Joint ECE-CS-IP Seminar, Colorado State University, 12.3.2019.
- Seminar Talk, University of Missouri, 14.3.2019.
- Colloquium Talk, University of Missouri, 14.3.2019.
- Keynote Talk, Spring School “Models and Data”, University of South Carolina, 21.3.–24.3.2019.
- Plenary Talk, Conference “Digital Future”, Berlin, 14.5.2019.
- Keynote Talk, Opening of Berlin Mathematics Research Center MATH+, 14.5.2019.
- Keynote Talk, International Conference on Calibration, Berlin, 21.–22.5.2019.
- Plenary Talk, Outreach Meeting “Approximation, sampling and compression in data science”, Newton Institute, Cambridge, 23.5.2019.
- Colloquium Talk, TU Berlin, 28.5.2019.
- Plenary Talk, International Conference on Constructive Theory of Functions, Sozopol, Bulgaria, 2.–8.6.2019.
- Invited Talk, Applied Mathematics Seminar, University of Warwick, 10.6.2019.
- Colloquium Talk, IST Austria, 13.6.2019.
- Plenary Talk, Workshop on “Approximation, sampling, and compression in high dimensional problems”, Newton Institute, Cambridge, UK, 17.–21.6.2019.

- Keynote Talk, Conference on Scale Space and Variational Methods in Computer Vision (SSVM) 2019, Hofgeismar, 30.6.–4.7.2019.
- Invited Talk, Seminar of the Computational Molecular Biology Group Zuse Institute Berlin, 3.7.2019.
- Plenary Talk, ILAS 2019: Linear Algebra without Borders, Rio de Janeiro, Brazil, 8.7.–12.7.2019.
- Invited Talk, Minisymposium “Deep Learning and Inverse Problems”, ICIAM 2019, Valencia, 15.7.–19.7.2019.
- (3 Invited Talks), Machine Learning Seminar, University of Tromsø, 13., 15., and 16.8.2019.
- Invited Talk, Workshop in honor of Ron DeVore, Sorbonne Université, 13.9.2019.
- Colloquium, Zurich Colloquium in Applied and Computational Mathematics, ETH Zürich, 23.9.2019.
- Plenary Talk, European Conference on Numerical Mathematics and Advanced Applications (ENUMATH), Egmond aan Zee, The Netherlands, 30.9.–4.10.2019.
- Invited Talk, Minisymposium “Advanced Numerical Methods in Image Processing”, European Conferences on Numerical Mathematics and Advanced Applications (ENUMATH), Egmond aan Zee, The Netherlands, 30.9.–4.10.2019.
- Colloquium Talk, Zurich Colloquium in Applied and Computational Mathematics, ETH Zürich, 7.10.2019.
- Keynote Talk, Woudschoten Conference on Numerical Analysis and Scientific Computing, Woudschoten Conference Center, Zeist, The Netherlands, 9.10.–11.10.2019.
- Invited Talk, BIRS-Workshop “Computational Harmonic Analysis and Data Science”, Oaxaca, Mexico, 28.10.–1.11.2019.
- Invited Talk, IPAM Workshop “Validation and Guarantees in Learning Physical Models: from Patterns to Governing Equations to Laws of Nature”, Los Angeles, 28.10.–1.11.2019.
- Invited Talk, Artificial Intelligence for 5G & Beyond Day, Fraunhofer HHI, Berlin, 5.11.2020.
- Invited Talk, Deep Learning Workshop, WIAS Berlin, 3.–5.12.2019.
- Invited Talk, Special session on “Mathematical Foundations of Deep Learning” at IEEE International Workshop on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP), Guadeloupe, West Indies, 15.–18.12.2019.

2020

- Invited Talk, IPAM-Workshop “Deep Learning and Medical Applications”, Los Angeles, 27.–31.1.2020.
- Invited Talk, MINDS Seminar, Johns-Hopkins University, Baltimore, 3.3.2020.
- Invited Talk, Seminar, Institute of Advanced Study, Princeton, 5.3.2020.
- Invited Talk, Applied Mathematics Seminar, Courant Institute, NYU, 6.3.2020.
- Invited Talk, (virtual) VisionLab-Seminar, Johns-Hopkins University, Baltimore, 1.5.2020.
- Plenary Talk, Virtual Conference on Mathematics of Data Science, organized by University of Edinburgh, 11.6.–12.6.2020.
- Invited Talk, One World Mathematics of INformation, Data, and Signals (1W-MINDS) Seminar, 18.6.2020.
- Invited Talk, Minisymposium on “Integration of Model-Based and Data-Based Methods with Medical Imaging”, (Virtual) SIAM Conference on Mathematics of Data Science, 23.6.–24.6.2020.
- Colloquium Talk, (virtual) MOX Colloquium, organized by Politecnico di Milano, 16.7.2020.
- Plenary Talk, (virtual) Annual GAMM COMINDS AG Workshop, MPI Leipzig, 10.9.–11.9.2020.

- Keynote Talk, Workshop on Machine Learning in Medical Image Reconstruction (ML-MIR), 23rd International Conference on Medical Image Computing and Computer Assisted Intervention (virtual MICCAI 2020), 4.10.–8.10.2020.
- Plenary Talk, MathSEE Symposium 2020 – Mathematics in Sciences (virtual), Engineering and Economics, Karlsruhe Institute of Technology, 7.10.–9.10.2020.
- Invited Talk, Workshop on The Analytical Foundations of Deep Learning: Interpretability and Performance Guarantees, C3.ai Digital Transformation Institute, 19.10.–23.10.2020.
- Plenary Talk, 11. Israel Machine Vision Conference (Virtual), 28.10.–29.10.2020.
- Invited Talk, Conference on the Mathematical Theory of Deep Neural Networks (DeepMath 2020) (virtual), Princeton Club New York, 5.11.–6.11.2020.
- Francqui Lecture Series (Inaugural Lecture and four longer Lectures), 30.11.–4.12.2020.
- Colloquium Talk, Zoom webinar series “Mathematics, Physics and Machine Learning”, Instituto Superior Tecnico Lisboa, 2.12.2021.
- Seminar Talk, Physics & Machine Learning Seminar, LMU Munich, 10.12.2020.
- Jour Fixe Talk, Exzellenzclusters STRUCTURES, Universität Heidelberg, 11.12.2020.

Cancelled or Postponed to 2021/2022 due to COVID-19

- Keynote Talk, Quarterly Lecture of the Berlin Mathematical Society, Museum of Technology, Berlin, 21.4.2020.
- Invited Talk, ESI Workshop on “Statistical estimation and deep learning in UQ for PDEs”, Vienna, 25.–29.5.2020.
- Invited Talk, ESI Workshop on “Approximation of high-dimensional parametric PDEs in forward UQ”, Vienna, 2.–5.6.2020.
- Invited Talk, Approximation Theory Workshop, Foundations of Computational Mathematics (FoCM 2020) Conference, Vancouver BC, Canada, 15.–24.6.2020.
- Invited Talk, International Conference “Approximation Theory and Applications” dedicated to the 100th anniversary of Professor S.B. Stechkin, Steklov Institute of Mathematics, Moscow, 6.9.–12.9.2020.
- Invited Talk, 8th International Conference on Computational Harmonic Analysis (ICCHA 2020), Munich, 14.9.–18.9.2020.
- Plenary Talk, Dutch Symposium on Inverse Problems, Amsterdam, 21.9.2020.
- Keynote Talk, Conference on “Mathematics of Machine Learning”, Center for Interdisciplinary Research (ZIF) in Bielefeld, 22.2.–25.2.2021.
- Invited Talk, Special Session “Approximationtheory and Data Analysis”, Joint Meeting DMV-Israeli Science Foundation, Hebrew University, Jerusalem, 8.3.–10.3.2021.
- Invited Talk, BIRS-Workshop “Big Data Inverse Problems”, Banff, Canada, 18.4.–23.4.2021.
- Plenary Talk, International Conference on Mathematical Methods for Curves and Surfaces (MMCS10), Oslo, 28.6.–2.7.2021.
- Invited Talk, BIRS-Workshop “Integration of Model- and Data-Driven Methods for Medical Imaging”, Oaxaca, Mexico, 12.9.–17.9.2021.

2021

- Tutorial Talk, TRIPODS Winter School on Graph Learning and Deep Learning, Johns Hopkins Mathematical Institute for Data Science (MINDS), 6.1.–8.1.2020.
- Invited Talk, TRIPODS Workshop on Graph Learning and Deep Learning, Johns Hopkins Mathematical Institute for Data Science (MINDS), 13.1.–15.1.2020.
- Panel Member, TRIPODS Workshop on Graph Learning and Deep Learning, Johns Hopkins Mathematical Institute for Data Science (MINDS), 13.1.–15.1.2020.
- Seminar Talk, Seismology Seminar, LMU Munich, 26.1.2021.
- Seminar Talk, Machine Learning Seminar, University of Tromsø, 27.1.2021.
- Seminar Talk, CSCAMM Seminar, University of Maryland, 3.2.2021.
- Invited Talk, Oberwolfach-Workshop “Mathematical Foundations of Machine Learning”, Mathematisches Forschungsinstitut Oberwolfach, 21.3.–27.3.2021.
- Invited Talk, Hot Topic Workshop on Safety and Security of Deep Learning, ICERM, 10.4.–11.4.2021.
- Invited Talk, Applied Mathematics Seminar, Yale University, 19.4.2021.
- Invited Talk, Workshop on Theory of Overparameterized Learning (virtual), 20.4.–21.4.2021.
- Seminar Talk, Seminar on AI in Medicine, TU Munich, 22.4.2021.
- Colloquium Talk, Garching Maier-Leibnitz-Colloquium, Munich, 22.4.2021.
- Invited Talk, Online lecture series “Mathematics of Deep Learning”, Universität Erlangen-Nürnberg, 27.4.2021.
- Seminar Talk, Centre Visual Intelligence Lectures, University of Tromsø, 29.4.2021.
- Panel Member, Panel on “Graph Neural Networks Beyond Message Passing”, Workshop on “Geometric and Topological Representation Learning”, ICLR 2021, 3.5.–7.5.2021.
- Invited Lecture, Maths in Society Lecture Series, TU Munich, 12.5.2021.
- Colloquium Talk, Statistics Colloquium, LMU Munich, 19.5.2021.
- Plenary Talk, Minisymposium in Honor of Maryam Mirzakhani, Hakim Sabzevari University, 20.5.2021.
- Seminar Talk, ETH Foundations of Data Science Seminar, ETH Zurich, 20.5.2021.
- Invited Talk, Special Session on “Machine Learning and Model Order Reduction for Large Scale Predictive Simulations”, 13th International Conference on Large-Scale Scientific Computations (LSSC’21), Sozopol, 7.6.–11.6.2021.
- Invited Lecture, Max Planck Institute of Biochemistry, 14.6.2021.
- Colloquium Talk, Würzburger Mathematisches Kolloquium, University of Würzburg, 15.6.2021.
- Plenary Talk, 8th European Congress of Mathematics, Portoroz, Slovenia, 20.6.–26.6.2021.
- Invited Talk, Symposium on Scientific Computing, Annual Meeting of the Canadian Society of Applied and Industrial Mathematics (CAIMS 2021), University of Waterloo, 21.6.–25.6.2021.
- Invited Talk, Oberwolfach-Workshop “Computation and Learning in High Dimensions”, Mathematisches Forschungsinstitut Oberwolfach, 1.–7.8.2021.
- Invited Talk, Geophysics Seminar, LMU Munich, 6.7.2021.
- Invited Lecture, Online Lecture Series “Beyond the Patterns”, Universität Erlangen-Nürnberg, 13.7.2021.
- Lecturer, Gene Golub SIAM Summer School (G2S3) on “Theory and Practice of Deep Learning”, AIMS, Cape Town, South Africa, 19.–30.7.2021.
- Invited Talk, IMA Workshop on Mathematical Foundation and Applications of Deep Learning, Purdue University, 12.–13.8.2021.
- Invited Talk, HCM Symposium 2020, Hausdorff Center, Bonn, 24.8.–26.8.2021.
- Invited Talk, CRM Applied Math Lab Seminar, McGill University, Canada, 27.9.2021.
- Invited Talk, Lecture Series SFB “Hybrid Societies”, TU Chemnitz, 8.10.2021.
- Keynote Talk, RingvorlesungLMU “Artificial Intelligence”, LMU Munich, 19.10.2021.

- Invited Talk, One World Signal Processing Seminar, 27.10.2021.
- Invited Talk, Seminar Cycle “Mathematics for Artificial Intelligence - MAIn 2021”, Politecnico di Torino, Italy, 3.11.2021.
- Invited Talk, Workshop of the Interdisciplinary Working Group “Future of Medicine”, Berlin-Brandenburg Academy of Sciences (BBAW), 5.11.2021.
- Colloquium Talk, DASHH Data Science Colloquium, Hamburg, 18.11.2021.
- Invited Talk, Workshop on “The Power of Women in Deep Learning”, Isaac Newton Institute, 22.11.–23.11.2021.
- Invited Talk, Virtual LC2 seminar (Learning, Computation, and Control), Imperial College London Applied Maths, 25.11.2021.

2022

- Seminar Talk, Virtual Seminar Series on “AIM2: Artificial Intelligence and Mathematics, fundamentals and beyond”, CNR-IAC, Italy, 12.1.2022.
- Invited Talk, Rotary Club, Munich, 15.1.2022.
- Eugen-Biser-Lecture, LMU Munich, 15.1.2022.
- Seminar Talk, Scripps Institution of Oceanography, San Diego, 18.1.2022.
- Invited Talk, The 9 th Seminar on Harmonic Analysis and Applications, 27.1.2022.
- Colloquium Talk, Mathematical Colloquium, Universität Ulm, 28.1.2022.
- Seminar Talk, Seminar on Medicine&AI, LMU Munich, 4.2.2022.
- Seminar Talk, DaSCI Webinar on AI, DaSCI Research Institute, University of Granada, Spain, 8.2.2022.
- Keynote Talk, Workshop on information theory for deep learning (IT4DL), Conference of the Association for the Advancement of Artificial Intelligence 2022, Vancouver, 22.2.–1.3.2022.
- Distinguished Lecturer, LMS Lecture Series, Cambridge University, 28.2.–4.2.2022.
- Invited Talk, Dagstuhl-Workshop “Graph Embeddings: Theory meets Practice”, Schloss Dagstuhl – Leibniz-Zentrum für Informatik, Germany, 27.–30.3.2022.
- Seminar Talk, DaSCI Research Institute of the University of Granada, Spain, 5.4.2022.
- Invited Talk, Mini-symposium on “Physics-based Machine Learning and Uncertainty Quantification”, SIAM Conference on Uncertainty Quantification, Atlanta, 12.–15.4.2022.
- Colloquium Talk, Institute of Natural Sciences, Shanghai Jiao Tong University, 19.4.2022.
- Invited Talk, Maths4DL Meeting, University of Bath, 21.–22.4.2022.
- Invited Talk, Cambridge University Maths Society (The Archimedean), Cambridge, 29.4.2022.
- Invited Talk, Follow-up Workshop “Mathematics of Data Science”, Hausdorff Center, Bonn, 25.–29.4.2022.
- Seminar Talk, SILO (Systems, Information, Learning and Optimization) Seminar Series, University of Wisconsin-Madison, 11.5.2022.
- Invited Talk, Seminar on “Machine learning for the working mathematician”, Sydney, 19.5.2022.
- Panel Member, Panel “Mathematical challenges in an AI driven world”, Conference 100UMI-800UNIPD, University of Padova, 23.–24.5.2022.
- Invited Talk, Workshop on “Statistical estimation and deep learning in UQ for PDEs”, ESI, Vienna, 30.5.–3.6.2022.
- Keynote Talk, AIM@LMU Ringvorlesung, LMU Munich, 8.6.2022.
- Invited Talk, Workshop on “AI in Science: Foundations and Applications”, LMU Munich, 9.–10.6.2022.
- Plenary Talk, National Symposium on AI and Mathematics at CWI, Amsterdam, 9.–10.6.2022.

- Panel Member, EC Panel “Science through the AI lens panel”, Joint Research Centre Summit, 13.6.2022.
- Keynote Talk, Workshop “Synergies between Data Science and PDE Analysis”, University of Bonn, 13.6.–17.6.2022.
- Keynote Talk, European Seminar on COmputing (ESCO 2022), Pilsen, Oland, 13.–17.6.2022.
- Panel Member, Panel on “Künstliche Intelligenz in Medizin & Alltag - Grenzen zum Wohle der Menschen” of LMU & TUM Medicine, 18.6.2022.
- Plenary Talk, Bedlewo Acta Numerica Conference, Banach Center, Bedlewo, Poland, 29.6.–2.7.2022.
- Invited Talk, International Congress of Mathematicians (ICM) 2022, Virtual, 6.7.–14.7.2022.
- Invited Talk, Session on AI, Congress of the American, European and French Mathematical Societies, Grenoble, 18.7.–22.7.2022.
- Plenary Talk, World Congress on Computational Intelligence (WCCI), Padova, 18.7.–23.7.2022.
- Plenary Talk, Workshop “Algorithmic Optimization and Data Science”, Trierer Graduiertenkolleg Algorithmische Optimierung, Trier, 20.–22.7.2022.
- Plenary Talk, the International Conference on Scientific Computation and Differential Equations (SciCADE’21), University of Iceland, Reykjavik, 25.7.–29.7.2022.
- Keynote Talk, MCML Kick-Off Event, Bavarian Academy of Sciences and Humanities, Munich, 27.7.2022.
- Keynote Talk, Section “Computational and mathematical methods in data science”, 92nd Annual Meeting of GAMM, Aachen, 15.–19.8.2022.
- Invited Talk, 2nd RAPTOR School “Loop Requirements”, Ljubljana, 4.–9.9.2022.
- Invited Talks (2x), Arnold Sommerfeld Center (ASC) Summer School, 12.–16.9.2022.
- Plenary Talk, Chemnitzer Finite-Elemente-Symposium, Herrsching am Ammersee, 15.–17.9.2022.
- Invited Talk, Information Geometry and Machine Learning Webinar, Stony Brook University, 7.10.2022.
- Invited Talk, Workshop on Machine Learning and Its Applications, National University of Singapore, 10.–28.10.2022.
- Invited talk, 55th National Congress of the Mexican Mathematics Society, Guadalajara, Mexico, 23.–28.10.2022.
- Keynote Talk, Machine Learning Frontiers in Precision Medicine (MLFPM) Event, München, 18.10.2022.
- Keynote Talk, Conference “Smarte neue Welt - Wie digital wollen wir leben?”, Center for Interdisciplinary Research, Bielefeld, 21.10.2022.
- Invited Talk, Session “Trustworthy AI”, AI Symposium, Tokyo, 27.–28.10.2022.
- Keynote Talk, Quantum Techniques in Machine Learning (QTML), Napoli, Italy, 8.–11.11.2022.
- Keynote Talk, Kick-off Event, DFG-Research Training Group 2339 “Interfaces, Complex Structures, and Singular Limits in Continuum Mechanics”, FAU Erlangen-Nürnberg, 11.11.2022.
- Keynote Talk, Lecture Series “Künstliche Intelligenz in der Medizin”, München, 14.11.2022.
- Invited Talk, Digicon 2022, München, 16.11.2022.
- Keynote Talk, Data Science Week 2022, Purdue University Fort Wayne, 30.11.2022.
- Invited Talk, Machine Learning in Medicine Webinar Series, Cornell University, 2.12.2022.
- Keynote Talk, AI for Good “Trustworthy AI” Workshop Series, 12.12.2022.
- Colloquium Talk, Universität Osnabrück, 14.12.2022.
- Colloquium Talk, SFB 876, TU Dortmund, 15.12.2022.
- Colloquium Talk, SFB 1481, RWTH Aachen, 16.12.2022.

2023

- Invited Talk, 3rd workshop on “Seeking Low Dimensionality in Deep Neural Networks” (SLOWDNN), MBZUAI, Abu Dhabi, 3.–6.1.2023.
- Invited Talk, HIDA Lecture Series & MUDS Lecture Series, Helmholtz, Munich, 25.1.2023.
- Keynote Talk, AI day at the Medical Faculty, Munich, 27.1.2023.
- Plenary Talk, International Conference on “Computational Mathematics for High-Dimensional Data in Statistical Learning”, MATRIX institute, Victoria, Australia, 30.1.–10.2.2023.
- Colloquium Talk, NYU-Abu Dhabi Mathematics Colloquium Series, 10.2.2023.
- Invited Talk, 2023 Joint DIP & Ollendorff-Minerva Center (OMC) Workshop on Cognitive Cloud Communications Networks, TU Munich, 16.–17.3.2023.
- Keynote Talk, Aktionskreis für Wirtschaft, Politik und Wissenschaft e.V., Bayerischer Landtag (Bavarian State Parliament), 21.3.2023.
- Keynote Talk, Workshop on Epistemology and Theory of Machine Learning, Munich Center for Mathematical Philosophy, 23.–24.3.2023.
- Invited Talk, Conference “Grenzen Künstlicher Intelligenz”, Hochschule für Philosophie München, Munich, 29.–31.3.2023.
- Invited Talk, Workshop on the occasion of Stephane Mallat’s 60th birthday, Bures-sur-Yvette, France, 19.–21.4.2022.
- Invited Talk, Women in Data Science (WiDS) Conference, FAU Erlangen-Nürnberg, 20.–21.4.2023.
- Invited Talk, Visual Intelligence Seminar, University of Tromsø, 27.4.2023.
- Invited Talk, Webinar on Scientific Machine Learning, NYCU, Taiwan, 28.4.2023.
- Keynote Talk, London Symposium on Information Theory, London, 25.5.2023.
- Colloquium Talk, MaLGA Colloquia Series, Machine Learning Genoa Center, 5.6.2023.
- Invited Talk, INdAM Workshop “Learning for Inverse Problems”, Rome, 5.–9.6.2022.
- Keynote Talk, Graph Signal Processing Workshop 2023, Oxford, 12.–14.6.2023.
- Invited Talk, OxML 2023, Oxford University, 6.–16.7.2023.
- Plenary Talk, Sampling Theory and Applications Conference (SampTA), Yale University, 10.–14.7.2023.
- Lecturer, GAMM Juniors Summer School on “Scientific Machine Learning”, Hannover, 31.7.–4.8.2023.
- Invited Talk, Plenary Session, 10th International Congress on Industrial and Applied Mathematics (ICIAM 2023), Tokyo, 20.–25.8.2023.
- Keynote Talk, Minisymposium on “Mathematics in Geometric Deep Learning”, ICIAM 2023, Tokyo, 20.–25.8.2023.
- 3 Invited Talks, Minisymposiums, ICIAM 2023, Tokyo, 20.–25.8.2023.
- Plenary Talk, Kaiserslautern Applied and Industrial Mathematics Days – KLAIM 2023, Kaiserslautern, 25.–27.9.2023.
- Plenary Talk, 32nd International Conference on Artificial Neural Networks, Heraklion, Greece, 26.–29.9.2023.
- Keynote Talk, 74. Jahrestagung und MTR-Tagung der bayerischen Röntgengesellschaft e. V., Landshut, 5.–7.10.2023.
- Keynote Talk, Company MicroDoc, Kitzbühel, 19.10.2023.
- Plenary Talk, Joint Meeting of the London Mathematical Society and Institute of Mathematics and its Applications, London, 13.10.2023.
- Keynote Talk, Thinkers’ Corner, Ludwigkirche, Munich, 8.11.2023.
- Keynote Talk, 30th anniversary of the Erwin Schrödinger Institute for Mathematics and Physics, Vienna, 10.11.2023.
- Colloquium Talk, Martini Colloquiums, TUM International Graduate School of Science and Engineering, Munich, 10.11.2023.

- Plenary Talk, I-X Breaking Topics in AI Conference, Imperial College London, 20.11.2023.
- Invited Talk, German Aerospace Center (DLR), Oberpfaffenhofen, 27.11.2023.
- Keynote Talk, 4th International Conference on Medical Imaging and Computer-Aided Diagnosis (MICAD2023), Cambridge, 9.–10.12.2023.
- Colloquium Talk, Colloquium of the CRC 1114, Potsdam, 14.12.2023.

2024

- Keynote Talk, Northern Lights Deep Learning (NLDL) Conference, 8.–11.1.2024.
- Impulse Lecture, Plattform Lernende Systeme of acatech, Tutzing, 19.1.2024.
- Colloquium Talk, ISOR Colloquium, University of Vienna, 22.1.2024.
- Keynote Talk, Bavarian Workshop on Optimization, University of Passau, 9.2.2024.
- Colloquium Talk, ECE Colloquium, Rutgers University, 21.2.2024.
- Invited Talk, Munich RE, München, 28.2.2024.
- Tutorial, Machine Learning Summer School, Okinawa Institute of Science and Technology, Japan, 4.–14.3.2024.
- Colloquium Talk, Barcelona Mathematics and Machine Learning Online Colloquium Series, 11.3.2024.
- Keynote Talk, Winter Conference in Statistics, Lapland Mountains of Sweden, 11.-14.3.2024.
- Keynote Talk, Workshop & Spring School “Ethics of AI (un-)explainability”, University of Münster, 19.3.2024.
- Pitch Talk, Münchener Universitätsgesellschaft, 20.3.2024.
- Seminar Talk, Bayesian+AI Seminar Series, LMU University Observatory, Munich, 11.4.2024.
- Distinguished Lecturer, UCLA, 6.–12.5.2024.
- Colloquium Talk, PTB, Abteilung 8: Medizinphysik und metrologische Informationstechnik, Berlin, 13.5.2024.
- Keynote Talk, Women in AI & Robotics, Munich, 14.5.2024.
- Colloquium Talk, Rutgers University, ECE Colloquium, 16.5.2024.
- Invited Talk, ICMS Workshop on “Big Data Inverse Problems”, Edinburgh, UK, 20.–24.5.2024.
- Invited Talk, MunichRe, 21.5.2024.
- Invited Talk, Leibniz-Rechenzentrum, Workshop on the Future of Computing, 22.5.2024.
- Plenary Talk, International Conference On Applied Mathematics (ICAM), City University of Hong Kong, 28.–31.5.2024.
- Invited Talk, AI for Good Global Summit, Workshop on “Explainable AI in the Era of Large Language Models”, Geneva, Switzerland, 30.–31.5.2024.
- Keynote Talk, SciML, KTH, Stockholm, 5.6.2024.
- Invited Talk, NVIDIA, 7.6.2024.
- Invited Talk, BIRS Workshop on “PDE Methods in Machine Learning: from Continuum Dynamics to Algorithms”, Granada, Spain, 9.–14.6.2024.
- Keynote Talk, BIRS Workshop “Mathematics of Deep Learning”, Oaxaca, 10.–14.6.2024.
- Plenary Talk, Conference Trends in Mathematical Sciences Conference, Erlangen, 10.–14.6.2024.
- Keynote Talk, Landeskriminalamt Rheinland-Pfalz, Mainz, 10.6.2024.
- Invited Talk, Applied Mathematics Student Club, LMU & TUM, 11.6.2024.
- Colloquium Talk, Mathematisches Kolloquium, Universität Augsburg, 18.6.2024.
- Invited Talk, ORNL AI Initiative Seminar Series, 20.6.2024.
- Plenary Talk, AI and Pure Mathematics Conference, University of Miami, 24.–29.6.2024.
- Seminar Talk, Netzwerkplattform Connecting Statistical Logic, Dynamical Systems and Optimization, Universität Konstanz, 2.7.2024.

- Plenary Talk, International Congress of Basic Science (ICBS 2024), Beijing, China, 14.–26.7.2024.
- Keynote Talk, Studientag Seniorenstudium, München, 20.7.2024.
- Plenary Talk, International Workshop on Operator Theory and its Applications (IWO-TA), University of Kent, Canterbury, 12.–15.8.2024.
- Plenary Talk, 9th International Conference on Computer and Information Science and Technology (CIST 2024), Barcelona, Spain, 19.–21.8.2024.
- Invited Talk, FORTH-Seminar, Heraklion, Crete, 4.9.2024.
- Plenary Talk, Focus Days “Mathematics in Imaging”, German Mathematical Society, Göttingen, 6.–7.9.2024.
- Keynote Talk, 19th Conference on Computer Science and Intelligence Systems (FedCSIS 2024) (IEEE #61123), Belgrade, Serbia, 8.–11.9.2024.
- Keynote Talk, Festakt zu 40 Jahre Zuse Institut Berlin, ZIB, Berlin, 13.9.2024.
- Keynote Talk, Heinz Nixdorf MuseumsForum, 17.9.2024.
- Invited Talk, Duke University, A Workshop in Honor of Ingrid Daubechies, 21.–22.9.2024.
- Lectures, CIME School on High-Dimensional Approximation Cetraro, Italy, 22.–27.9.2024.
- Keynote Talk, Symposium 2024 on “KI in der Hochschullehre”, München, 23.9.2024.
- Invited Talk, Princeton University, IDeAS Seminar@PACM, 24.9.2024.
- Invited Talk, Columbia University, Student Seminar Series, 25.9.2024.
- Invited Talk, Simons Foundation, Simons MoDL Annual Meeting, New York, 26.–27.9.2024.
- Colloquium Talk, ISOR Colloquium, University of Vienna, Vienna, 7.10.2024.
- Keynote Talk, Round Table PrüfenPlus, LMU, München, 10.10.2024.
- Invited Talk, Symposium on “AI in radiation therapy”, Munich, 14.10.2024.
- Plenary Talk, IEEE International Conference on Image Processing (ICIP 2024), Abu Dhabi, United Arab Emirates, 27.–30.10.2024.
- Keynote Talk, 28th International Computer Science and Engineering Conference (ICSEC 2024), Khon Kaen, Thailand, 6.–8.11.2024.
- Invited Talk, Workshop “Explainable Artificial Intelligence”, KIT, Karlsruhe, 12.11.2024.
- Panelist, MISSION KI Zukunftsfragen, Acatech, 13.11.2024.
- Invited Talk, French-German Dialogue on Generative AI, TU Nürnberg, 18.–19.11.2024.
- Invited Talk, DeSBiFG Seminar, Fraunhofer HHI, Berlin, 28.11.2024.
- Keynote Talk, Berlin-Brandenburgische Akademie der Wissenschaften, Klassensitzung der Mathematisch-Naturwissenschaftlichen Klasse, Berlin, 29.11.2024.
- Keynote Talk, Bremer Symposium AI in Health, Bremen, 2.–3.12.2024.
- Pitch Talk, Parlamentarischer Abend, Deutsche Parlamentarische Gesellschaft, 3.12.2024.
- Keynote Talk, Deutsche Krebsforschungszentrum (DKFZ), NCT Data Science Seminar, 11.12.2024

2025 (up to now)

- Plenary Talk, Conference on 65 Years of BIT Numerical Mathematics, Uppsala, Sweden, 14.–16.1.2025.
- Keynote Talk, DLD Conference, Munich, 16.1.2025.
- Keynote Talk, Grand Opening AI-HUB@LMU, München, 29.1.2025.
- Invited Talk, Simulation & Digital Twin Tech Talks, Siemens, 3.2.2025.
- Plenary Talk, DTE & AICOMAS, Paris, 17.–21.2.2025.
- Invited Talk, Bosch Engineering GmbH, Campus Holzkirchen, 24.2.2025.
- Invited Talk, Seminar des Max Weber-Programms, TU Munich, 28.2.2025.
- Keynote Talk, EU Innovation Hub for Internal Security, Valetta, Malta, 6.–7.3.2025.
- Keynote Talk, Einführungsveranstaltung – Bayerischer KI-Innovationsbeschleuniger, House of Communication, München, 10.3.2025

- Keynote Talk, Grand Opening gAIIn, München, 8.4.2025.
- Invited Talk, Women Innovating Math & AI Nights, Abu Dhabi, 16.4.2025.
- Colloquium Talk, KAIST, Computer Science Colloquium, Seoul, 21.4.2025.
- Invited Talk, Seminar on the Frontiers of AI, Universität Wien, 8.5.2025.
- Invited Talk, Workshop On Mathematical Information Science, Huawei Lagrange Center, Paris, 13.–15.5.2025.
- Invited Talk, Spiking Neural Network Workshop, LMU Munich, 27.–28.5.2025.
- Invited Talk, NAAI International Artificial Intelligence Seminar, Virtual World, 31.5.2025.
- Keynote Talk, hEART (13th Symposium of the European Association for Research in Transportation), TU Munich, 10.–13.6.2025.
- Invited Talk, AI Pioneers, TU Munich, 16.6.2025.
- Invited Talk, BIRS-Workshop On Efficient and Reliable Deep Learning Methods and their Scientific Applications, Banff, 22.–27.6.2025.
- Keynote Talk, AI For Good Global Summit, Workshop “Navigating the intersect of AI, environment and energy for a sustainable future”, Geneva, 8.–11.7.2025.
- Pitch Talk, AI For Good Global Summit, Center Stage, Geneva, 8.–11.7.2025.
- Keynote Talk, General Assembly, Münchner Universitätsgesellschaft, 16.7.2025.
- Invited Talk, Seminar “Todays applied is tomorrows pure mathematics”, UK Knowledge Exchange Hub, 24.7.2025.
- Invited Talk, Workshop “Graph Learning Meets Theoretical Computer Science”, Simons Institute, Berkeley 11.–15.8.2025.
- Keynote Talk, Workshop “Mathematical Analysis of Adversarial Machine Learning”, Oaxaca, Mexico, 18.–23.8.2025.
- Invited Talk, Workshop “Computation and Learning in High Dimensions”, Oberwolfach, 18.–23.8.2025.
- Invited Talk, 10th Workshop on High-Dimensional Approximation, Bonn, 8.–12.9.2025.
- Keynote Talk, Conference on Mathematics of Machine Learning, University of Hamburg, 22.–25.9.2025.
- Keynote Talk, IHK-Webinar Series “Künstliche Intelligenz verstehen und nutzen”, 23.9.2025.
- Panelist, Panel “Ethics of AI Agents”, Carl Friedrich von Siemens Stiftung, München, 25.9.2025.
- Panelist & Pitch Talk, PLS-Konferenz, Humboldt Carré, Berlin, 30.9.2025.
- Colloquium Talk, Stockholm Mathematics Center, KTH & Stockholm University, 1.10.2025.
- Invited Talk, Erlöserkirche München, 6.10.2025.
- Keynote Talk, ML in PL Conference, Warsaw, Poland, 15.–17.10.2025.
- Invited Talk, Netzwerkveranstaltung zwischen Wissenschaft und Verwaltung zum Thema KI, LMU, 17.10.2025.
- Invited Talk, International Workshop “Morphogenesis and morphing, 200 years after Gauss”, Centro di Ricerca Matematica Ennio De Giorgi, Scuola Normale Superiore, Pisa, 20.–24.10.2025.
- Invited Talk, Staatskanzlei, Mainz, 14.11.2025.

Further Invitations/Leadership Functions/Honors

2009	Guest on the Red Sofa in the Mathematikum, Gießen
2009	Nomination for Program Chair for the SIAM Activity Group on Imaging Science
2010	Inscription in the Internet Portal “AcademiaNet” for Excellent Female Researchers
2010	Invitation for Panel of the FWO
2012	Public Einstein Lecture

2012 Guest on the Red Sofa in the Mathematikum, Gießen
 2012–2022 Founding member and Chair of the GAMM Activity Group “Mathematical Signal- and Image Processing”
 2013 Invitation to the DFG-Round Table on “Compressed Sensing”
 2013 Inclusion in Hübners “Who is Who in Deutschland”
 2013–2020 Member of the SampTA Steering Committee
 2013 Election to the SPARS Steering Committee
 2013 Election to the IPODI Selection Committee and election to become chair
 2013 Election to the Committee for “NaFöG–Elsa-Neumann-Scholarships of the state of Berlin”
 2014 Election to the Managing Board of the International Association of Applied Mathematics and Mechanics (GAMM)
 2015–2021 Coordination of the DFG-Priority Programm “Compressed Sensing in Information Theory”, SPP 1798 (joint with R. Mathar)
 2015– Consultant for the Fraunhofer Herinrich-Hertz-Institute (HHI)
 2016 Election to Vice Chair of the SIAM Activity Group on Imaging Sciences
 2016–2018 Election to the Selection Committee GAMM Juniors Fellows
 2016– Election to the Executive Board of the SFB/TR 109
 2017 Invitation for a Panel of the European Research Council
 2017 Invitation as Expert to InfoRadio rbb, 91. Treffpunkt WissensWerte “Mathe ist schön”
 2017– Election to the Executive Board of the RTG BIOQIC
 2018 Election to Chair of the SIAM Activity Group on Imaging Sciences
 2018– GAMM Representative in the Council of the European Mathematical Society
 2018 Member of the Committee for the Expert Council “Mathematics” of the Universität Hamburg
 2018 Member of the Committee for the Expert Council “Computer Science” of the Universität Hamburg
 2018– Election to the Executive Board of the SFB 1114
 2018–2023 Spokesperson of the RTG “Differential Equation- and Data-driven Models in Life Sciences and Fluid Dynamics: An Interdisciplinary Research Training Group (DAEDALUS)”, RTG 2433
 2018 Member of the Berlin Delegation for the DFG Review of the Excellence Cluster MATH+
 2019 Salon Sophie Charlotte of the Academy 2019, Host, Natural Sciences
 2019 Chair of the SIAG/Imaging Science Nominating Committee
 2019– Member of the SIAM Committee on Committees and Appointments
 2019– Founding member and Chair of the MATH+ Activity Group “Mathematics of Data Science”
 2019– Founding member and Chair of the GAMM Activity Group “Computational and Mathematical Methods in Data Science”
 2020– Speaker of the working group “Digitalization in Medicine“ of the Berlin-Brandenburg Academy of Sciences (BBAW)
 2020 Interview, Present Futures Forum Webcast, TU Berlin
 2020 Expert Service, International Day of Mathematics
 2020– Member of the Board of Foundations of Computational Mathematics
 2021 Main Organizer of the 6-Month Programme “Mathematics of Deep Learning” at the Isaac Newton Institute for Mathematical Sciences
 2021–2027 Main Coordinator of the DFG-Priority Programm “Mathematical Foundations of Deep Learning”, SPP 2298

- 2021– Board Member of the Carathéodory-Gesellschaft zur Förderung der Mathematik in Wirtschaft, Universität und Schule an der Ludwig-Maximilians-Universität München e.V.
- 2021 Invitation to serve as Vice-Chair of the SIAM Activity Group on Data Science (pending institution of this activity group by SIAM)
- 2021– Member in the Tenure-Committee of the Universität Hamburg
- 2021– Member of the Arnold Sommerfeld Center for Theoretical Physics (ASC)
- 2021–2023 Spokesperson of the Research Focus “Next Generation AI” at the Center for Advanced Studies (CAS) at LMU Munich
- 2022– Member of the Scientific Advisory Board for the EPSRC Programme Grant “Mathematics of Deep Learning”
- 2022 Panelist at the Round Table on “Mathematical challenges in an AI driven world”, International Conference in honor of the 100th anniversary of the Italian Mathematical Union (UMI) and the 800th anniversary of the University of Padova
- 2022– Member in the “Gesellschaft für mathematische Forschung e.V.”
- 2022– Member of the Scientific Committee of the Mathematical Research Center Oberwolfach
- 2022– Member of the Committee of Oberwolfach Seminars
- 2022–2023 Election to Vice President-at-Large of SIAM
- 2022– Member of the Advisory Board for the Maths4DL (Mathematics for Deep Learning) Programme Grant
- 2022– Associated Member of the Arnold-Sommerfeld-Center at LMU Munich
- 2022 Einladung als Expertin zur Veranstaltung “AI for life – KI: Mitten im Leben!” mit Ministerpräsident Dr. Markus Söder
- 2022 Chair of the Selection Committee of Helmholtz Imaging
- 2022– Member of the platform “Learning Systems” of the Federal Ministry of Education and Research (BMBF)
- 2022– Member of the Munich School for Data Science (MUDS)
- 2023 Chair of the Selection Committee of Helmholtz Imaging
- 2023 Panelist at the Panel on “ONE Munich: Trustworthiness of Human-Centered Robotics and AI”, munich_i fair, Munich, 28.6.2023.
- 2023 Panelist at the Panel on “AI in Germany: Opportunities and Challenges”, Zuse-Event, Dresden, 26.10.2023
- 2023– Associated Member of the Center for Responsible AI Technologies
- 2023– Honorary Member and Advisor: Woman in AI and Robotics
- 2023– Member of ELLIS Munich
- 2023 Panelist at the Baiosphere-Panel “Challenges of AI and Abuse”, TU München, 18.12.2023.
- 2023 Interview by the Bayerischer Rundfunk, Channel Computermagazin, 19.12.2023.
- 2023 Guest as Expert on AI on the “aktienlust LIVE – Die Börsen Show”, Fulda, 21.12.2023.
- 2024– Member of the Advisory Board, Technical University of Nuremberg
- 2024– Initiator and Spokesperson of the AI-HUB@LMU
- 2024 Panelist at the Panel “KI – Quo Vadis?”, Vertretung des Freistaats Bayern beim Bund, 31.1.2024.
- 2024– Core Member of the Panel for ICM, Section 15, Numerical Analysis and Scientific Computing
- 2024 Member of the Scientific Advisory Board of the Estonian Centre of Excellence in AI
- 2024– GAMM Representative at LMU Mathematics

- 2025 Member of the Advisory Board for the ERC Synergy Grant Project OCEAN “Intelligence on Networks”
- 2025– Member of the MCQST Excellence Cluster
- 2025 Member of the Council for “Zusammenarbeit von Wissenschaft und Verwaltung” of TUM and DHV
- 2025– Member of the Female Leadership Circle CIONET Germany
- 2025– Elected Division Head of the Computational and Information Sciences Division of the European Academy of Sciences

Prize Committees

- 2014 & 2016 Member of the Weyl Prize Selection Committee
- 2017 – Member of the International Jury for the START-Program and the Wittgenstein-Prize
- 2017 – 2018 Member of the Selection Committee for the Caroline von Humboldt-Professur and the Caroline von Humboldt-Prize
- 2019 Chair of the SIAG/Imaging Science Prize Committee
- 2020 – 2023 Member of the AMS Grenander Prize Selection Committee
- 2021 – Member of the Scientific Committee for the Hang Lung Math Award
- 2021 Chair of the SIAG/DATA Career Prize and the SIAG/DATA Early Career Prize
- 2024 – Member of the ICBS Basic Science Lifetime Award Selection Committee – TCIS
- 2025 Member of the Prize Committee for the Prize in the Mathematics of Artificial Intelligence
- 2025 Chair of the SIAG/DATA Career Prize and the SIAG/DATA Early Career Prize

Refereeing and Reviewing Work

- Member of the Advisory Boards for the following book series:
 - Applied and Numerical Harmonic Analysis (Birkhäuser-Springer)
 - Lecture Notes in Applied and Numerical Harmonic Analysis, Springer Briefs (Springer)
 - Mathematics of Data, Springer
 - Studium Mathematik (Springer)
- Editor for the journals:
 - Acta Applicandae Mathematicae (Corresponding Editor), since 2007
 - Advances in Computational Mathematics (Associate Editor), since 2016
 - Applied and Computational Harmonic Analysis (Associate Editor), since 2021
 - Communications of the American Mathematical Society (Editor), since 2025
 - Constructive Approximation, since 2019
 - IEEE Access, since 2025
 - IEEE Signal Processing Letters (Senior Associate Editor for Compressed Sensing), 2012–2019
 - IEEE Transactions on Information Theory (Associate Editor for Signal Processing), 2017–2020
 - IMA Journal of Numerical Analysis, since 2018

- International Journal of Wavelets, Multiresolution and Information Processing (Associate Editor), 2012–2020
- Journal de l'Ecole Polytechnique (Associate Editor), 2013–2018
- Journal of Approximation Theory (Associate Editor), since 2014
- Journal of Fourier Analysis and Applications (Associate Editor), since 2009
- Journal of Machine Learning (Associate Editor), since 2022
- Journal of Mathematical Imaging and Vision (Associate Editor), 2014–2022
- Journal of Wavelet Theory and Applications (Associate Editor), 2006–2019
- Mathematical Foundations of Machine Learning (Associate Editor), since 2025
- Mathematics of Data, Learning, and Intelligence (Associate Editor), since 2025
- SIAM Journal on Imaging Sciences (Associate Editor), 2018–2023
- SIAM Journal on Mathematics of Data Science (Associate Editor), 2018–2021, (Section Editor), since 2022
- SIAM News (SIAM Activity Group Liaison), 2018–2019, 2021–2022
- The Journal of Machine Learning for Biomedical Imaging, since 2020
- Editor for the following special issues:
 - “Operator Algebra and Representation Theory: Frames, Wavelets and Fractals” in Numerical Functional Analysis and Optimization, 2010 (gemeinam mit P. Jorgensen, G. Olafson, and Q. Sun).
 - “Sparse Approximate Solution of Linear Systems” in Linear Algebra and its Applications, 2013 (joint with A. Pinkus, H. Rauhut, and V. Temlyakov).
 - “Mathematical Signal and Image Processing” in GAMM Mitteilungen, 2014 (joint with G. Plonka-Hoch, and G. Steidl).
 - “Mathematical Image Analysis” in the Journal of Mathematical Imaging and Vision, 2014 and 2016 (joint with J. Fadilli, G. Peyre, G. Plonka-Hoch, and G. Steidl).
 - “Mathematical Foundations of Deep Learning in Imaging Science” in the Journal of Mathematical Imaging and Vision, 2019 (joint with J. Bruna, E. Haber, T. Pock, and R. Vidal).
 - “ILAS Rio 2019 Conference” in Linear Algebra and its Applications, 2020 (joint with N. Abreu, C. Helmberg, and V. Trevisan).
 - IEEE Signal Processing Magazine “Math of Deep Learning” 2025 (joint with J. Bruna, L. Bolzano, R. Nowak, J. Ye).
- Member of the scientific advisory board for the following books:
 - LNAI xxAI – Beyond explainable Artificial Intelligence, Springer, 2021.
- Referee for the journals:
 - Abstract and Applied Analysis
 - Acta Applicandae Mathematicae
 - Acta Mathematica Sinica
 - Acta Mathematica Vietnamica
 - Advances in Computational Mathematics
 - Advances in Operator Theory
 - Analysis and Mathematical Physics
 - Archiv der Mathematik
 - Applied and Computational Harmonic Analysis
 - Applied Numerical Mathematics
 - Banach Journal of Mathematical Analysis
 - Bulletin of Iranian Mathematical Society
 - Bulletin of the Belgian Mathematical Society

- Constructive Approximation
- Contemporary Mathematics
- Czechoslovak Mathematical Journal
- Discrete and Computational Geometry
- Discrete Applied Mathematics
- Duke Mathematical Journal
- EURASIP Journal on Applied Signal Processing
- EuroVis
- Glasnik Matematicki
- IEEE Journal of Biomedical and Health Informatics
- IEEE Signal Processing Magazine
- IEEE Transactions on Big Data
- IEEE Transactions on Computational Imaging
- IEEE Transactions on Image Processing
- IEEE Transactions on Information Theory
- IEEE Transactions on Signal Processing
- Illinois Journal of Mathematics
- Image Communication
- Indian Journal of Mathematics
- Information Fusion
- International Journal of Wavelets, Multiresolution and Information Processing
- Inverse Problems
- Journal of Applied Functional Analysis
- Journal of Applied Mathematics
- Journal of Approximation Theory
- Journal of Computational and Applied Mathematics
- Journal of Computational Mathematics
- Journal of Computational Physics
- Journal of Contemporary Mathematical Analysis
- Journal of Fourier Analysis and Applications
- Journal of Functional Analysis
- Journal of Geometric Analysis
- Journal of Geophysics and Engineering
- Journal of Inequalities and Applications
- Journal of Machine Learning Research
- Journal of Mathematical Analysis and Applications
- Journal of Mathematical Imaging and Vision
- Journal of Nonlinear Science
- Journal of the Belgian Mathematical Society
- Journal of the London Mathematical Society
- Journal of Visual Communication and Image Representation
- Linear Algebra and its Applications
- Linear and Multilinear Algebra
- Mathematical Inequalities & Applications
- Mathematical Problems in Engineering
- Mathematische Nachrichten
- Methods and Applications of Analysis
- Monatshefte für Mathematik
- Nature Communications
- Pattern Recognition Letters

- Proceedings of the AMS
 - Proceedings of the EMS
 - Results in Mathematics
 - Rocky Mountain Journal of Mathematics
 - Sampling Theory in Signal and Image Processing
 - SIAM Journal on Applied Mathematics
 - SIAM Journal on Imaging Sciences
 - SIAM Journal on Mathematical Analysis
 - SIAM Journal on Matrix Analysis
 - SIAM Journal on Numerical Analysis
 - SIAM Journal on Scientific Computing
 - Signal, Image, and Video Processing
 - Signal Processing
 - Transactions of the American Mathematical Society
 - Transactions on Pattern Analysis and Machine Intelligence
 - Zeitschrift für Analysis und ihre Anwendungen
- (Meta-)Reviewer for major conferences:
 - ICML 2020
 - NeurIPS 2020
 - ICML 2021
 - NeurIPS 2021
 - ICML 2022
 - MSML 2022
 - NeurIPS 2022
 - ICML 2023
 - NeurIPS 2023
 - xAI-2024
 - ICML 2024
 - NeurIPS 2024
 - ICML 2025
 - ICLR 2025
 - NeurIPS 2025
- Reviewer for international science foundations:
 - Deutsche Forschungsgemeinschaft (DFG).
 - Deutsche Mathematiker Vereinigung (DMV).
 - Dutch National Science Foundation (NWO).
 - European Commission (EC).
 - Fonds zur Förderung der wissenschaftlichen Forschung (FWF)
 - French National Research Agency (ANR).
 - German-Israeli Foundation for Scientific Research and Development (GIF).
 - Icelandic Centre for Research (Rannis).
 - Israel Science Foundation (ISF).
 - Ministerium für Wissenschaft, Forschung und Kunst Baden-Württemberg.
 - National Science Foundation in den USA (NSF).
 - Österreichische Akademie der Wissenschaften.
 - United States-Israel Binational Science Foundation (BSF).
 - The Royal Society.
 - Vienna Science and Technology Fund (WWTF).

- Reviewer for research centers:
 - Centre de Recerca Matemàtica (Barcelona, Spain)
 - Helmholtz AI (Munich, Germany)
 - Isaac Newton Institute for Mathematical Sciences (Cambridge, UK)
 - Matheon (Berlin, Germany)
- Reviewer for the *Mathematical Reviews*.
- 2008: Panelist for the *National Science Foundation (NSF)*.
- 2009: Juror for *Jugend forscht* auf Bundesebene.
- 2017: Panelist for the *European Research Council (ERC)*.
- External Reviewer for Ph.D. Theses (at Chalmers University of Technology, Justus-Liebig-Universität Gießen, Norwegian University of Science and Technology, Skoltech, Tel Aviv University, Universität Bremen, Universität Leipzig, Universität Potsdam, University of British Columbia, University of Buenos Aires, University of Cambridge, etc.), as well as for Habilitation Theses (at Universität Osnabrück, Universität Wien, Universität Innsbruck, etc.).
- External Member of several Hiring Committees (at Saarland University, Universitat Politècnica de Catalunya, University of Bayreuth, University of Leipzig, University of Luxembourg, University of Vienna, and University of Zurich, etc.)

Organization of Meetings

2006

- Summer Meeting of the Oberseminar Marburg – Gießen “Approximationstheorie und Numerik”, Justus-Liebig-Universität Gießen, 6.6.2006.
- Workshop on Wavelet-Analyse at the Deutsche EEG/EP Mapping Meeting, Schloss Rauischholzhausen, 20.10.–22.10.2006 (joint with A. Klein and T. Sauer).

2008

- Special Session “Sparse Representations, Frames, and Signal Processing”, CISS 2008 (Conference on Information Sciences and Systems), Princeton University, 19.3.–21.3.2008 (joint with A. Pezeshki).
- 6th International Conference on “Wavelet Analysis and Pattern Recognition” (ICWAPR 2008), Hong Kong, 29.8.–31.8.2008 (Member of the Program Committee).
- Dagstuhl-Seminar “Structured Decompositions and Efficient Algorithms”, Schloß Dagstuhl, Leibniz Zentrum für Informatik, 30.11.–5.12.2008 (joint with S. Dahlke, I. Daubechies, M. Elad and G. Teschke).

2009

- Banff-Workshop “Frames from first principles: Error correction, symmetry goals, and numerical efficiency”, Banff International Research Station, 15.3.–20.3.2009 (joint with B. Bodmann, P. G. Casazza, V. Paulsen, and O. Yilmaz).
- Special Session “Geometric Multiscale Analysis”, SampTA 2009, Centre International de Rencontres Mathématiques in Marseille, 18.5.–22.5.2009.
- Special Session “From Frames to Fusion Frames”, The International Symposium on Optical Science and Technology, SPIE’s 54th Annual Meeting in San Diego, Wavelets XIII, 2.8.–6.8.2009 (joint with P. G. Casazza).

2010

- Special Session “Compressed Sensing, Sparse Approximation, and Frame Theory”, CISS 2010 (Conference on Information Sciences and Systems), Princeton University, 17.3.–19.3.2010 (joint with A. Pezeshki).
- Mini-Symposium “Microlocal Analysis and Imaging”, SIAM Conference on Imaging Science (IS10), Chicago, 12.4.–14.4.2010 (joint with M. Cheney).
- Birthday Conference in Honor of Pete Casazza’s 65th Birthday, Norbert Wiener Center, University of Maryland, 20.5.–22.5.2010. (Program Chair; joint with B. Bodmann, C. Heil, and T. Strohmer).
- Mini-Symposium “Sparse Approximation”, Curves and Surfaces 2010, Avignon, 24.6.–30.6.2010.
- Special Session “Geometric Multiscale Analysis”, New Trends in Harmonic and Complex Analysis, Bremen, 29.6.–3.7.2010.
- Oberwolfach-Mini-Workshop “Shearlets”, Oberwolfach, 4.10.–8.10.2010. (Organizer; joint with D. Labate).

2011

- Dagstuhl-Seminar “The impact of sparse representations and efficient sensing”, Schloß Dagstuhl, Leibniz Zentrum für Informatik, 30.1.–4.2.2011 (joint with S. Dahlke, M. Elad, Y. Eldar, and G. Teschke).
- Banff-Workshop “Sparse and Low Rank Approximation”, Banff International Research Station, 6.3.–11.3.2011 (joint with H. Rauhut, J. Tropp, and O. Yilmaz).
- Oberwolfach-Conference “Operator Algebras and Representation Theory: Frames, Wavelets and Fractals”, Oberwolfach, 27.3.–2.4.2011. (Organizer; joint with P. Jorgenson, G. Ólafsson, and S. Silvestrov).
- Conference “SampTA11”, Singapore, 2.5.–6.5.2011 (Program Chair; joint with L. Fesquet, B. Torræssani, and Y. Eldar).
- Special Session “Geometric Multiscale Analysis”, Conference “SampTA11”, Singapore, 2.5.–6.5.2011.
- Joint Seminar University of Osnabrueck – Jacobs University, Bremen, 24.5.2011 (Organizer; joint with G. Pfander).
- 32. Norddeutsches Kolloquium über Angewandte Analysis und Numerische Mathematik, Osnabrück, 27.5.–28.5.2011 (Organizer; joint with S. Kunis).
- Mini-Symposium “Compressed Sensing and Sparse Approximation Algorithms”, Conference ILAS 2011, Braunschweig, 22.8.–26.8.2011 (joint with H. Rauhut).
- Special Session “Frames and Sparse Approximations”, The International Symposium on Optical Science and Technology, SPIE’s 55th Annual Meeting in San Diego, Wavelets and Sparsity XIV, 21.8.–25.8.2011 (joint with R. Balan and B. Bodmann).

2012

- Oberwolfach-Conference “Applied Harmonic Analysis and Sparse Approximation”, Oberwolfach, 10.6.–16.6.2012. (Organizer; joint with I. Daubechies, H. Rauhut and T. Strohmer).
- Special Session “Sparse Optimization and Generalized Sparsity Models”, ISMP 2012, Berlin, 20.8.–24.8.2012.

- Matheon-Workshop “Sparse Representation of Functions: Analytic and Computational Aspects”, TU Berlin, 10.12.–14.12.2012 (joint with V. Mehrmann and M. Pfetsch).

2013

- Special Session “Mathematical Image Processing”, GAMM 2013, Novi Sad, 18.–22.3.2013 (joint with O. Scherzer).
- Minisymposium “Anisotropic Approximations and Function Spaces”, 14th International Conference on Approximation Theory, San Antonio, 7.–10.4.2013 (joint with J. Lemvig).
- AIM (American Institute of Mathematics)-Workshop “Frame theory intersects geometry”, Palo Alto, 29.7.–2.8.2013 (joint with B. Bodmann and T. Römer).
- SAMPTA 2013, Jacobs University Bremen, Germany, 1.7.–5.7.2013 (Member of the Technical Program Committee).
- International Symposium on Information Theory (ISIT), Istanbul, 7.7.–12.7.2013 (Member of the Technical Program Committee).
- Conference SPARS 2013, EPFL, Lausanne, Switzerland, 8.7.–11.7.2013 (Member of the Technical Program Committee).
- Special Session “Frames and Sparse Approximations”, The International Symposium on Optical Science and Technology, SPIE’s 57th Annual Meeting in San Diego, Wavelets and Sparsity XIV, 25.8.–29.8.2013 (joint with R. Balan and B. Bodmann).
- Minisymposium “Compressed Sensing”, Workshop of the GAMM activity group “Applied and Numerical Linear Algebra”, Universität Wuppertal, Germany, 9.9.–10.9.2013.
- Matheon-Workshop “Compressed Sensing and its Applications”, TU Berlin, 9.12.–13.12.2013 (joint with H. Boche, R. Calderbank and J. Vybiral).

2014

- Joint GAMM ANLA-MSIP Workshop on “Matrix Computations for Sparse Recovery”, TU Berlin, 9.4.–11.4.2014 (joint with P. Benner)
- SMAI-SIGMA conference “Curves and Surfaces”, Paris, France, 12.6.–18.6.2014, (Member of the Scientific Committee).
- International Symposium on Information Theory (ISIT), Honolulu, Hawaii, 29.6.–4.7.2014 (Member of the Technical Program Committee).
- Banff-Workshop “Sparse Representations, Numerical Linear Algebra, and Optimization”, Banff International Research Station, 5.10.–10.10.2014 (joint with M. Saunders, S. Wright, and O. Yilmaz).
- Mini-Symposium on “Recent Advances in Magnetic Resonance Imaging”, SIAM Conference on Imaging Science (IS14), Hong Kong, 12.5.–14.5.2014 (joint with W.-Q Lim).
- 2nd IEEE Global Conference on Signal and Information Processing (GlobalSIP), Symposium on “Information Processing for Big Data”, Atlanta, 3.12.–5.12.2014 (Member of the Technical Program Committee).
- Minisymposium “Applied Harmonic Analysis and Sparse Approximation”, 5th International Conference on Scientific Computing and Partial Differential Equations (SCPDE14), Hong Kong Baptist University, Hong Kong, 8.12.–12.12.2014 (joint with X. Zhuang).

2015

- Oberwolfach-Workshop “New Discretization Methods for the Numerical Approximation of PDEs”, Oberwolfach, 11.1.–17.1.2015 (Organizer; joint with S. Dahlke, R. Stevenson, and E. Süli).
- Special Session “Frame Theory”, 11th International Conference on Sampling Theory and Applications (SampTA 2015), Washington DC, 25.5.–29.5.2015 (joint with G. Pfander).
- SampTA15, Washington, 25.5.–29.5.2015 (Member of the Steering Committee).

- SPARS “Signal Processing with Adaptive Sparse Structured Representations”, Cambridge, 6.7.–9.7.2015 (Member of the Steering Committee).
- Special Session “Frames and Sparse Approximations”, The International Symposium on Optical Science and Technology, SPIE’s 59th Annual Meeting in San Diego, Wavelets and Sparsity XV, 9.8.–13.8.2015 (joint with R. Balan und B. Bodmann).
- Minisymposium “Compressed Sensing, Extensions and Applications”, International Congress on Industrial and Applied Mathematics (ICIAM 2015), Beijing, China, 10.8.–14.8.2015 (joint with H. Rauhut).
- Oberwolfach-workshop “Applied Harmonic Analysis and Sparse Approximation”, Oberwolfach, 16.8.–22.8.2015 (Organizer; joint with I. Daubechies, H. Rauhut, and T. Strohmer).
- Minisymposium “Applied and Computational Harmonic Analysis”, DMV Annual Meeting, Hamburg, 21.9.–25.9.2015 (joint with J. Lemvig).
- 2. International Matheon Conference “Compressed Sensing and its Applications”, TU Berlin, 7.12.–11.12.2015 (joint with H. Boche, G. Caire, R. Calderbank, and R. Mathar).

2016

- Conference on “Multivariate Approximation and Interpolation with Application (MAIA 2016)”, Paris, 18.1.–20.1.2016 (Member of the Scientific Committee).
- International Geometry Summit (IGS 2016), Berlin, 20.6.–24.6.2016 (Member of the Organisation Committee).
- Minisymposium “Nonlinear Approximation”, 9th Conference on Mathematical Methods for Curves and Surfaces, Tonsberg, Norway, 23.6.–28.6.2016.
- EMS Summer School on “Modelling, Analysis and Simulation Crime and Image Processing”, Cambridge, 4.7.–8.7.2016 (joint with A. Münch, J. Tanner, and B. Wagner).
- BMS Summer School “Mathematics and Computation in Imaging Science” (joint with M. Hintermüller), Berlin, 24.7.–5.8.2016.
- IEEE Information Theory Workshop 2016 (ITW 2016), Cambridge, UK, 11.9.-14.9.2016 (Member of the Technical Program Committee).
- CoSIP Winter Retreat, TU Berlin, 7.12.–9.12.2017 (joint with H. Boche, R. Mathar, and M. März).

2017

- International Conference on Wavelet and Tensor Methods for Partial Differential Equations, Berlin, 3.5.–5.5.2017 (joint with H. Harbecht, P. Petersen, and A. Uschmajew).
- Gene Golub SIAM Summer School 2017 on “Data Sparse Approximations and Algorithms”, Berlin, 29.5.–9.6.2017 (joint with J. Liesen and V. Mehrmann).
- IEEE International Symposium on Information Theory (ISIT), Aachen, Germany, 25.6.–30.6.2017 (Member of the Technical Program Committee).
- 8th International Conference on Reliable Methods and Mathematical Modeling (RAMM8), Berlin, 30.7.–2.8.2017 (joint with C. Carstensen).
- Special Session “Mathematical Data Analysis and Frame Theory”, The International Symposium on Optical Science and Technology, SPIE’s 61th Annual Meeting in San Diego, Wavelets and Sparsity XVII, 6.8.–10.8.2017 (joint with R. Balan and B. Bodmann).
- WIAS/TUB-Workshop on Deep Learning, High-Dimensional Approximations, and Uncertainty Quantification, Berlin, 12.9.–15.9.2017 (joint with M. Eigel, R. Schneider, and C. Spokoiny).
- CoSIP Intense Course on Deep Learning, 29.11.–1.12.2017 (joint with R. Mathar and M. März).
- 3. International Matheon Conference “Compressed Sensing and its Applications”, TU Berlin, 4.12.–8.12.2017 (joint with H. Boche, G. Caire, R. Calderbank, and R. Mathar).

2018

- Workshop on “The Mathematics of Deep Learning”, Hong Kong University of Science and Technology, 6.1.–10.1.2018 (joint with J. Cai, A. Cohen, B. Jing, Y. Wang, Y. Yao, and D. Zhou).
- International Conference on Mathematical Image Analysis (MIA’18), Berlin, 15.1.–17.1.2018 (Member of the Organizing Committee).
- Session “SPP 1798: Compressed Sensing in Information Processing (CoSIP)”, GAMM Annual Meeting, TU München, 19.3.–23.3.2018 (joint with R. Mathar).
- Oberwolfach-Workshop “Applied Harmonic Analysis and Data Processing”, Oberwolfach, 25.3.–31.3.2018. (Organizer; joint with I. Daubechies, H. Rauhut and T. Strohmer).
- Minisymposium “Analysis, Optimization, and Applications of Machine Learning in Imaging”, SIAM Conference on Imaging Science (IS18), Bologna, Italy, 5.6.–8.6.2018 joint with M. Möller).
- SMAI-SIGMA Conference on “Curves and Surfaces”, Arcachon, France, 28.6.–4.7.2018 (Member of the Scientific Committee).
- Compressive Sensorics and Radar (CoSeRa2018), Siegen, 10.9.–13.9.2018 (Co-Chair).
- Minisymposium “Mathematics of Compressed Sensing”, CoSeRa2018, Siegen, 10.9.–13.9.2018 (joint with Bouchot).
- Oberwolfach Seminar on “Mathematics of Deep Learning”, 14.10.–20.10.2018 (joint with P. Grohs).

2019

- Session “SPP 1798: Compressed Sensing in Information Processing (CoSIP)”, GAMM Annual Meeting, TU Wien, 18.2.–22.2.2019 (joint with R. Mathar).
- Workshop “Mathematics of data: Structured representations for sensing, approximation and learning”, Alan Turing Institute, London, 27.5.–31.5.2019 (Member of the Scientific Committee).
- IEEE International Symposium on Information Theory (ISIT 2019), Paris, 7.7.–12.7.2019 (Member of the Technical Programm Committee).
- Minisymposium “Frame Theory and Data Science”, ILAS 2019: Linear Algebra without Borders, Rio de Janeiro, Brazil, 8.7.–12.7.2019 (joint with D. Needell).
- Minisymposium “Theoretical Foundations of Deep Learning”, 9th International Congress on Industrial and Applied Mathematics (ICIAM 2019), Valencia, Spain, 15.7.–19.7.2019 (joint with P. Petersen).
- Panel “The Future of Mathematics in the Age of Machine Learning”, 9th International Congress on Industrial and Applied Mathematics (ICIAM 2019), Valencia, Spain, 15.7.–19.7.2019.
- 10th Applied Inverse Conference (AIP’19), Grenoble, France, 8.7.–12.7.2019 (Member of the Scientific Committee).
- International Conference on Continuous Optimization (ICCOPT) 2019, Berlin, 5.8.–8.8.2019 (Cluster Chair for “Big Data and Machine Learning”).
- BMS Summer School 2019 on “Mathematics of Deep Learning”, ZIB, Berlin, 19.–31.8.2019 (Organizer, joint with K.-R. Müller, F. Noe, C. Schütte, and V. Spokoiny).
- Oberwolfach-Workshop “Innovative Approaches to the Numerical Approximation of PDEs”, Oberwolfach, 1.9.–7.9.2019. (Organizer; joint with S. Dahlke, R.H. Nocetto, and R. Stevenson).
- Inaugural GAMM Workshop on Computational and Mathematical Methods in Data Science, ZIB, Berlin, 24.9.–25.9.2019 (Organizer, gemeinsam mit T. Conrad, C. Schütte, M. Stoll).

- First Banach Center–Oberwolfach Graduate Seminar, Bandelow, Poland, 17.11.–23.11.2019 (Organizer, joint with P. Grohs).

2020

- IPAM Workshop on “Deep Learning and Medical Applications”, IPAM, Los Angeles, 27.1.–31.1.2020 (joint with B. Glocker, M. Niethammer, S. J. Osher, D. Rueckert, J. K. Seo, M. Unser, and J. C. Ye).

Cancelled or Postponed to 2021/2022 due to COVID-19

- Session “SPP 1798: Compressed Sensing in Information Processing (CoSIP)”, GAMM Annual Meeting, Kassel, 16.3.–20.3.2020 (gemeinsam mit H. Rauhut).
- First International SIAM Conference on “Mathematics of Data Science”, Cincinnati, 5.5.–9.5.2020 (Chair, joint with A. Pinar und J. Tropp).
- MATH+ Workshop on “Machine Learning in Imaging Sciences: Bridging the gap between Theory and Practice”, WIAS Berlin, 11.–13.5.2020 (joint with M. Hintermüller, K. Papafitsoros, G. Dong, K. Tabelow, T. Schäffter, and H.-C. Hege).
- 3-Day Workshop on “Computational Harmonic Analysis and Compressive Sensing”, Conference on the Foundations of Computational Mathematics (FoCM’20), Vancouver, Canada, 15.6.–24.6.2020 (Organizer; joint with K. Gröchenig and H. Rauhut).
- Banff-Workshop “Continuum Models and Optimisation for Deep Neural Networks”, Banff International Research Station, 10.1.–15.1.2021 (joint with C. Geldhauser and C. Schönlieb).
- CIRM Thematic Month on “Harmonic analysis, multiscale representations and applications to complex transforms”, Luminy, France, 25.1.–26.2.2021 (Member of the Scientific Committee).

2021

- Isaac Newton Institute Programme “Mathematics of Deep Learning”, Cambridge, UK, 1.7.–17.12.2021 (Main Organizer, joint with P. Barlett, A. Jentzen, A. Hansen, and C. Schönlieb).
- Workshop “Theory of Deep Learning”, Isaac Newton Institute, Cambridge, 9.8.–13.8.2021 (Organizer, joint with F. Bach, P. Bartlett, and L. Ruthotto).
- MSML21 (Mathematical and Scientific Machine Learning Conference) Lausanne, Switzerland, 16.8.–19.8.2021 (Member of the Program Committee).
- Workshop “Deep Learning and Inverse Problems”, Isaac Newton Institute, Cambridge, 27.9.–1.10.2021 (Organizer, joint with S. Arridge, P. Maass, O. Öktem, and C.-B. Schönlieb).
- Workshop “Deep Learning and Partial Differential Equations”, Isaac Newton Institute, Cambridge, 15.–19.11.2021 (Organizer, joint with W. E, P. Grohs, and A. Jentzen).
- Workshop “Women in Deep Learning”, Isaac Newton Institute, Cambridge, 22.11.–23.11.2021 (Organizer, joint with R. Alaifari, M. Jannik, and C.-B. Schönlieb).
- Oberwolfach-Workshop “Applied Harmonic Analysis and Data Science”, Oberwolfach, 28.11.–4.12.2021 (Organizer; joint with I. Daubechies, H. Rauhut und T. Strohmer).
- Workshop “Interpretability, Security, and Safety of Deep Learning”, Isaac Newton Institute, Cambridge, 13.12.–17.12.2021 (Organizer, joint with A. Fawzi, A. Hansen, M. Rodriguez, and W. Samek).

2022

- Workshop on the Theory of Overparameterized Machine Learning (TOPML 2022), virtual event, 5.–6.4.2022 (Member of the Organizing Committee).
- 10th SMAI-SIGMA conference on “Curves and Surfaces”, Arcachon, France, 28.6.–4.7.2022 (Member of the Scientific Committee).

- 35th Annual Conference on Learning Theory (COLT 2022), London, UK, 2.7.–5.7.2022 (Member of the Programm Committee).
- Section on the SPP “Theoretical Foundations of Deep Learning”, 92nd Annual Meeting of GAMM, Aachen, 15.–19.8.2022 (Organizer).
- 8th International Conference on Computational Harmonic Analysis, Munich, 12.9.–16.9.2022 (Conference Chair).
- Session “AI for a Sustainable Society”, AI Symposium, Tokyo, 27.–28.10.2022 (Moderation).

2023

- 2023 International Biomedical and Astronomical Signal Process (BASP) Frontiers workshop, Villars-sur-Ollon, Switzerland, 5.–10.2.2023, Session on “Large-scale optimization” (Organizer).
- IPAM Programme “Computational Microscopy”, Los Angeles, 13.3.–16.6.2023 (Organizer, joint with Binev, Kirkland, Miao, Murnane, Needell, Saghi, Singer, Osher, Voyles, and Waller).
- RoboAICon2023, Rome, Italy, 23.–25.3.2023 (Member of the Organizing Committee).
- 3-Day Workshop on “Computational Harmonic Analysis and Compressive Sensing”, Conference on the Foundations of Computational Mathematics (FoCM’20), Whistler, Canada, 12.6.–21.6.2023 (Organizer; joint with K. Gröchenig and H. Rauhut).
- CEMRACS 2023, Marseille, France, 17.7.–25.8.2023 (Member of the Scientific Committee).
- Workshop “Formal methods techniques in robotics systems: Design and control”, IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Detroit, USA, 1.–5.10.2023 (Organizer, joint with A. Swikir, F. Abu-Dakka, S. Haddadin, W. Burgard, M. Zamani, and N. Ozay).
- Conference on “Quantum Techniques in Machine Learning”, CERN, Switzerland, 19.–24.11.2023 (Member of the Programm Committee).
- LMU AI Symposium, 29.11.2023 (Main Organizer).

2024

- Conference on Low-dimensional Structures (CLS), Hong Kong, 3.–5.1.2024 (Co-Chair)
- Workshop on Radio Maps and Their Applications, ICASSP 8024, Seoul, Korea, 14.–19.4.2024 (Organizer, joint with C. Yapar, F. Jaensch, R. Levie, and G. Caire).
- Oberwolfach-Workshop “Applied Harmonic Analysis and Data Science”, Oberwolfach, 21.4.–26.4.2024 (Organizer; joint with I. Daubechies and H. Rauhut).
- BIRS-Workshop “Mathematics for Deep Learning”, Oaxaca, Mexico, 10.–14.6.2024 (Organizer; joint with E. Dobriban and R. Vidal).
- The 2nd World Conference on eXplainable Artificial Intelligence, Malta, Valletta, 17.–19.7.2024 (Member of the Programm Committee).
- SIAM Conference on Mathematics of Data Science (SIMODS) 2024 (GAMM Representative)
- Online Workshop “Hey GPT! Can you help me understand the Universe? A synoptic view at the impact of chatGPT technologies on the future of astronomy (ESOGPT24)”, European Southern Observatory (ESO), Garching, 23.–27.9.2024 (Member of the Scientific Organizing Committee).

2025 (up to now)

- Grand Opening AI-HUB@LMU, München, 29.1.2025 (Main Organizer).
- Grand Opening gAIIn, München, 8.4.2025 (Main Organizer).
- Workshop on Spiking Neural Networks, München, 27.–28.3.2025 (Main Organizer).

- Munich AI Lecture, Guido Montufar, 17.7..2025 (Main Organizer).
- Seminar für Hochbegabte, LMU, 31.7.2025 (Main Organizer).
- 3rd World Conference on eXplainable Artificial Intelligence, 9.–11.7.2025 (Chair Breaking Word).
- Round Table: KI an der LMU, 30.7.2025 (Main Organizer).
- Munich AI Lecture, Yoshua Bengio, 23.10.2025 (Main Organizer).
- LMU KI Symposium, 10.11.2025 (Main Organizer).

Committees and Service

Universität Paderborn:

- | | |
|-------------|---|
| 1996 – 2004 | Member of numerous committees of the Institute of Mathematics, e.g., <ul style="list-style-type: none"> • some Hiring Committees, • a committee to plan the annual “Tag der Fakultät”, • a committee to revise the examination regulation for Ph.D. and “Habilitation” |
| 2001 – 2002 | Board member of the alumni association “Die Matiker” |
| 2000 – 2002 | Representative of the scientific assistants in mathematics in the Faculty Committee |

Justus–Liebig–Universität Gießen:

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|-------------|---------------------------------|
| 2004 – 2006 | Women’s representative |
| 2006 | Member of two Hiring Committees |

Universität Osnabrück:

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|------------|--|
| 2008 | Chairperson of a Hiring Committee |
| 2009 | Member of three Hiring Committees |
| 2009 | Presentation at the “Parent’s Day” |
| Since 2009 | Colloquium Organizer |
| Since 2009 | Member of the Executive Board of the Institute |
| Since 2009 | Member of the “TaskForce Mathematics” |
| Since 2009 | Chairperson of the Organization Committee of the annual “Day of Mathematics” |
| Since 2009 | Chairperson of the Committee for Communication and Marketing |
| 2010 | Presentation at the “Mathe Treff” for high school students |
| Since 2010 | Alternate Member of the Faculty Committee |
| 2010 | Fundraising for the Colloquiums |
| 2010 | Fundraising for the “Day of Mathematics” |
| 2010 | Talk at the “Technology Day of Osnabrück” |

Technische Universität Berlin and Berlin’s Scientific Community:

- | | |
|------|--|
| 2011 | Chairperson of a Hiring Committee |
| 2012 | Member of the delegation of the BMS for the DFG evaluation |
| 2012 | Member of two Hiring Committees |
| 2012 | Founding Member of the Einstein Center Berlin |
| 2012 | Talk at the “Day of Mathematics” |
| 2012 | Tag at the “Schüler-Info-Tagen” |
| 2012 | Presentation of the celebration of MATHEON Anniversary |

2013	Member of two Hiring Committees
2013	Member of two Selection Committees for a Young Researchers Position in ECMath
2013	Member of one Selection Committees for a Young Researchers Position in MATHEON
2013	Chairperson of the committee to plan the graduation celebration “Dies Mathematicus”
2013–2015	Member of the Executive Board of the Department of Mathematics
2015	Member of one Hiring Committee
Since 2012	Member of the Executive Board of the Berlin Mathematical School (BMS)
Since 2012	Member of the Admissions Committee of the Berlin Mathematical School (BMS)
Since 2012	Member of the Council of the MATHEON
2013–2018	Chairperson of the IPODI Selection Committee
2013–2018	Member of the Committee for awarding the “NaFöG–Elsa-Neumann-Scholarships of the state of Berlin”
Since 2014	Scientific Director of the “Berlin International Graduate School in Model- and Simulation based Research (BIMoS)”
Since 2015	Member of the Executive Board of the Einstein Center for Mathematics Berlin (ECMath)
Since 2015	Member of the Advisory Board Internationalisation of the TU Berlin
2016	Member of four internal and three external Hiring Committees
2017–2018	Member of Committee for the Organization of a Colloquium for Female Mathematicians
2017–2019	Executive Director of the “Berlin International Graduate School in Model- and Simulation based Research (BIMoS)”
Since 2017	Official Representative for the courses for non-mathematics majors (Group D)
Since 2017	Substitute Member in the women’s council
2018	Member of four Hiring Committees
2018	Substitute Member of one Hiring Committee
2018	Chairperson of a Hiring Committee
2018	Vice Chairperson of a Hiring Committee
2018	Member of the MATH+ Founding Board
Since 2018	Member of the MATH+ Research Projects Committees
Since 2018	Member of the MATH+ Data Management Committee
Since 2018	Special Coordinator for Mathematical Data Science in MATH+
Since 2018	PI in Charge of Emerging Field “Learning Dynamical Laws” in MATH+
Since 2018	Member of the MATH+ Council
Since 2018	Member of the MATH+ Executive Board
Since 2020	Chair of the MATH+ Visiting Scholars Committee

Ludwig-Maximilians-Universität München:

Since 2020	LMU Expertenservice
Since 2020	Member of IT Committee
2021	Member of 5 Hiring Committees
Since 2021	Chair of the Committee “AI Courses in Mathematics”
Since 2021	Member of the Organization Committee “Munich Summer Colloquium in Mathematics”
2022	Member of 3 Hiring Committees

Since 2022	Member of the Strategy Board of the Munich Center for Machine Learning (MCML)
Since 2024	Initiator and Spokesperson of the AI-HUB@LMU
2025	Member of a Tenure Track Committee

Membership in Professional Societies

- American Mathematical Society (AMS)
- Carathéodory-Gesellschaft zur Förderung der Mathematik in Wirtschaft, Universität und Schule an der Ludwig-Maximilians-Universität München e.V.
- Deutscher Hochschulverband (DHV)
- Deutsche Mathematiker–Vereinigung (DMV)
- ELLIS Munich
- European Mathematical Society (EMS)
- Foundations of Computational Mathematics (FoCM)
- GAMM Activity Group on Computational and Mathematical Methods in Data Science: *Founding Member*
- GAMM Activity Group on Mathematical Signal- and Image Processing: *Founding Member*
- German Data Science Society (GDS) e.V.
- Gesellschaft für Inverse Probleme
- Gesellschaft für mathematische Forschung e.V.
- IEEE Information Theory Society (IEEE ITS)
- IEEE Signal Processing Society (IEEE SPS)
- Institute of Electrical and Electronics Engineers (IEEE)
- International Association of Applied Mathematics and Mechanics (GAMM)
- LMU Innovation & Entrepreneurship Center
- LMU Open Science Center
- Münchener Universitätsgesellschaft (MUG)
- Münchner Kreis
- Munich School for Data Science (MUDS)
- Society for Industrial and Applied Mathematics (SIAM)
- SIAM Activity Group on Data Science
- SIAM Activity Group on Imaging Science
- Verein zur Förderung des Mathematischen Forschungsinstitutes Oberwolfach a.V.
- Women in AI & Robotics

List of Publications

Journal Publications

1. E. Kaniuth and G. Kutyniok. Zeros of the Zak transform on locally compact abelian groups. *Proc. Amer. Math. Soc.* **126** (1998), 3561–3569.
2. G. Kutyniok. Linear independence of time-frequency shifts under a generalized Schrödinger representation. *Arch. Math.* **78** (2002), 135–144.
3. G. Kutyniok. The Zak transform on certain locally compact groups. *J. of Math. Sciences* **1** (2002), 62–85.
4. K. Gröchenig, D. Han, C. Heil, and G. Kutyniok. The Balian-Low theorem for symplectic lattices in higher dimensions. *Appl. Comput. Harmon. Anal.* **13** (2002), 169–176.
5. G. Kutyniok. Ambiguity functions, Wigner distributions and Cohen’s class for LCA groups. *J. Math. Anal. Appl.* **277** (2003), 589–608.
6. C. Heil and G. Kutyniok. Density of weighted wavelet frames. *J. Geom. Anal.* **13** (2003), 479–493.
7. G. Kutyniok. A qualitative uncertainty principle for functions generating a Gabor frame on LCA groups. *J. Math. Anal. Appl.* **279** (2003), 580–596.
8. G. Kutyniok. A weak qualitative uncertainty principle for compact groups. *Illinois J. Math.* **47** (2003), 709–724.
9. P.G. Casazza, G. Kutyniok, and M.C. Lammers. Duality principles in Frame Theory. *J. Fourier Anal. Appl.* **10** (2004), 383–408.
10. G. Kutyniok and T. Strohmer. Wilson bases for general time-frequency lattices. *SIAM J. Math. Anal.* **37** (2005), 685–711.
11. W. Czaja, G. Kutyniok, and D. Speegle. The geometry of the parameters of wave packet frames. *Appl. Comput. Harmon. Anal.* **20** (2006), 108–125.
12. G. Kutyniok. The local integrability condition for wavelet frames. *J. Geom. Anal.* **16** (2006), 155–166.
13. G. Kutyniok. Beurling density and shift-invariant weighted irregular Gabor systems. *Sampl. Theory Signal Image Process.* **5** (2006), 131–149.
14. P.G. Casazza, G. Kutyniok, and D. Speegle. A redundant version of the Rado-Horn Theorem. *Linear Algebra Appl.* **418** (2006), 1–10.
15. G. Kutyniok and D. Labate. The theory of reproducing systems on locally compact abelian groups. *Colloq. Math.* **106** (2006), 197–220.
16. G. Kutyniok and D. Labate. Construction of Regular and Irregular Shearlet Frames. *J. Wavelet Theory and Appl.* **1** (2007), 1–10.
17. R. Balan, P.G. Casazza, D. Edidin, and G. Kutyniok. A fundamental identity for Parseval frames. *Proc. Amer. Math. Soc.* **135** (2007), 1007–1015.
18. G. Kutyniok. Affine density, frame bounds, and the admissibility condition for wavelet frames. *Constr. Approx.* **25** (2007), 239–253.
19. P.G. Casazza and G. Kutyniok. A generalization of Gram-Schmidt orthogonalization generating all Parseval frames. *Adv. Comput. Math.* **27** (2007), 65–78.
20. C. Heil and G. Kutyniok. The Homogeneous Approximation Property for Wavelet Frames. *J. Approx. Theory* **147** (2007), 28–46.

21. P. G. Casazza, G. Kutyniok, D. Speegle, and J. C. Tremain. A Decomposition Theorem for frames and the Feichtinger Conjecture. *Proc. Amer. Math. Soc.* **136** (2008), 2043–2053.
22. W. Czaja, G. Kutyniok, and D. Speegle. Beurling dimension of Gabor pseudo frames of affine subspaces. *J. Fourier Anal. Appl.* **14** (2008), 514–537.
23. P. G. Casazza, G. Kutyniok, and S. Li. Fusion frames and distributed processing. *Appl. Comput. Harmon. Anal.* **25** (2008), 114–132.
24. S. Dahlke, G. Kutyniok, P. Maass, C. Sagiv, H.-G. Stark, and G. Teschke. The uncertainty principle associated with the continuous shearlet transform. *Int. J. Wavelets Multiresolut. Inf. Process.* **6** (2008), 157–181.
25. C. Heil and G. Kutyniok. Density of frames and Schauder bases of windowed exponentials. *Houston J. Math.* **34** (2008), 565–600.
26. K. Gröchenig, G. Kutyniok, and K. Seip. Landau’s necessary density conditions for LCA groups. *J. Funct. Anal.* **255** (2008), 1831–1850.
27. G. Kutyniok, A. Pezeshki, A. R. Calderbank, and T. Liu. Robust Dimension Reduction, Fusion Frames, and Grassmannian Packings. *Appl. Comput. Harmon. Anal.* **26** (2009), 64–76.
28. G. Kutyniok and D. Labate. Resolution of the wavefront set using continuous shearlets. *Trans. Amer. Math. Soc.* **361** (2009), 2719–2754.
29. G. Kutyniok and T. Sauer. Adaptive Directional Subdivision Schemes and Shearlet Multiresolution Analysis. *SIAM J. Math. Anal.* **41** (2009), 1436–1471.
30. S. Dahlke, G. Kutyniok, G. Steidl, and G. Teschke. Shearlet Coorbit Spaces and associated Banach Frames. *Appl. Comput. Harmon. Anal.* **27** (2009), 195–214.
31. B. G. Bodmann, P. G. Casazza, and G. Kutyniok. A Quantitative Notion of Redundancy for Finite Frames. *Appl. Comput. Harmon. Anal.* **30** (2011), 348–362.
32. R. Calderbank, P. G. Casazza, A. Heinecke, G. Kutyniok, and A. Pezeshki. Sparse Fusion Frames: Existence and Construction. *Adv. Comput. Math.* **35** (2011), 1–31.
33. B. Boufounos, G. Kutyniok, and H. Rauhut. Sparse Recovery from Combined Fusion Frame Measurements. *IEEE Trans. Inform. Theory* **57** (2011), 3864–3876.
34. P. Kittipoom, G. Kutyniok, and W.-Q Lim. Irregular Shearlet Frames: Geometry and Approximation Properties. *J. Fourier Anal. Appl.* **17** (2011), 604–639.
35. G. Kutyniok and W.-Q Lim. Compactly Supported Shearlets are Optimally Sparse. *J. Approx. Theory* **163** (2011), 1564–1589.
36. B. Han, G. Kutyniok, and Z. Shen. Adaptive Multiresolution Analysis Structures and Shearlet Systems. *SIAM J. Numer. Anal.* **49** (2011), 1921–1946.
37. P. G. Casazza, A. Heinecke, F. Krahmer, and G. Kutyniok. Optimally Sparse Frames. *IEEE Trans. Inform. Theory* **57** (2011), 7279–7287.
38. P. Kittipoom, G. Kutyniok, and W.-Q Lim. Construction of Compactly Supported Shearlets. *Constr. Approx.* **35** (2012), 21–72.
39. G. Kutyniok, J. Lemvig, and W.-Q Lim. Optimally Sparse Approximations of 3D Functions by Compactly Supported Shearlet Frames. *SIAM J. Math. Anal.* **44** (2012), 2962–3017.
40. G. Kutyniok, M. Shahram, and X. Zhuang. ShearLab: A Rational Design of a Digital Parabolic Scaling Algorithm. *SIAM J. Imaging Sci.* **5** (2012), 1291–1332.

41. D. L. Donoho and G. Kutyniok. Microlocal Analysis of the Geometric Separation Problem. *Comm. Pure Appl. Math.* **66** (2013), 1–47.
42. G. Kutyniok, K. A. Okoudjou, F. Philipp, and E. K. Tuley. Scalable Frames. *Linear Algebra Appl.* **438** (2013), 2225–2238.
43. G. Kutyniok. Clustered Sparsity and Separation of Cartoon and Texture. *SIAM J. Imaging Sci.* **6** (2013), 848–874.
44. F. Krahmer, G. Kutyniok, and J. Lemvig. Sparsity and spectral properties of dual frames. *Linear Algebra Appl.* **439** (2013), 982–998.
45. J. Cahill, P. G. Casazza, and G. Kutyniok. Operators and Frames. *J. Operat. Theor.* **70** (2013), 145–164.
46. G. Kutyniok. Geometric Separation by Single-Pass Alternating Thresholding. *Appl. Comput. Harmon. Anal.* **36** (2014), 23–50.
47. E. J. King, G. Kutyniok, and X. Zhuang. Analysis of Inpainting via Clustered Sparsity and Microlocal Analysis. *J. Math. Imaging Vis.* **48** (2014), 205–234.
48. P. Grohs and G. Kutyniok. Parabolic Molecules. *Found. Comput. Math.* **14** (2014), 299–337.
49. F. Krahmer, G. Kutyniok, and J. Lemvig. Sparse Matrices in Frame Theory. *Comput. Stat.* **29** (2014), 547–568.
50. M. Genzel and G. Kutyniok. Asymptotic Analysis of Inpainting via Universal Shearlet Systems. *SIAM J. Imaging Sci.* **7** (2014), 2301–2339.
51. B. Bodmann, G. Kutyniok, and X. Zhuang. Gabor Shearlets. *Appl. Comput. Harmon. Anal.* **38** (2015), 87–114.
52. B. Adcock, A. C. Hansen, G. Kutyniok, and J. Ma. Linear Stable Sampling Rate: Optimality of 2D Wavelet Reconstructions from Fourier Measurements. *SIAM J. Math. Anal.* **47** (2015), 1196–1233.
53. X. Chen, G. Kutyniok, K. A. Okoudjou, F. Philipp, and R. Wang. Measures of Scalability. *IEEE Trans. Inform. Theory* **61** (2015), 4410–4423.
54. H. Lakshman, W.-Q Lim, H. Schwarz, D. Marpe, G. Kutyniok, and T. Wiegand. Image interpolation using Shearlet based iterative refinement. *Signal Proc. Image Comm.* **36** (2015), 83–94.
55. G. Kutyniok, W.-Q Lim, and R. Reisenhofer. ShearLab 3D: Faithful Digital Shearlet Transforms based on Compactly Supported Shearlets. *ACM Trans. Math. Software* **42** (2016), Article No.: 5.
56. P. Grohs, S. Keiper, G. Kutyniok, and M. Schäfer. α -Molecules. *Appl. Comput. Harmon. Anal.* **41** (2016), 297–336.
57. G. Kutyniok and W.-Q Lim. Dualizable Shearlet Frames and Sparse Approximation. *Constr. Approx.* **44** (2016), 53–86.
58. D. Mücke-Herzberg, P. Abellan, M. Sarahan, I. Godfrey, Z. Saghi, R. Leary, A. Stevens, J. Ma, G. Kutyniok, F. Azough, R. Freer, P. Midgley, N. Browning, and Q. Ramasse. Practical Implementation of Compressive Sensing for High Resolution STEM. *Microsc. Microanal.* **22(S3)** (2016), 558–559.
59. P. Grohs, S. Keiper, G. Kutyniok, and M. Schäfer. Cartoon Approximation with α -Curvelets. *J. Fourier Anal. Appl.* **22** (2016), 1235–1293.

60. G. Kutyniok and P. Petersen. Classification of Edges using Compactly Supported Shearlets. *Appl. Comput. Harmon. Anal.* **42** (2017), 245–293.
61. G. Kutyniok, V. Mehrmann, and P. Petersen. Regularization and Numerical Solution of the Inverse Scattering Problem Using Shearlet Frames. *J. Inverse Ill-Posed Probl.* **25** (2017), 287–309.
62. G. Kutyniok, V. Paternostro, and F. Philipp. The Effect of Perturbations of Frame Sequences and Fusion Frames on Their Duals. *Oper. Matrices* **11** (2017), 301–336.
63. T. Conrad, N. Cvetkovic, M. Genzel, G. Kutyniok, C. Schütte, J. Vybiral, and N. Wulkow. Sparse Proteomics Analysis – a compressed sensing-based approach for feature selection and classification of high-dimensional proteomics mass spectrometry data. *BMC Bioinformatics* **18** (2017), 160–180.
64. S. Keiper, G. Kutyniok, D. G. Lee, and G. E. Pfander. Compressed Sensing for Finite-Valued Signals. *Linear Algebra Appl.* **532** (2017), 570–613.
65. A. Flinth and G. Kutyniok. PROMP: A Sparse Recovery Approach to Lattice-Valued Signals. *Appl. Comput. Harmon. Anal.* **45** (2018), 668–708.
66. R. Reisenhofer, S. Bosse, G. Kutyniok, and T. Wiegand. A Haar Wavelet-Based Perceptual Similarity Index for Image Quality Assessment. *Signal Proc. Image Comm.* **61** (2018), 33–43.
67. G. Kutyniok and W.-Q. Lim. Optimal Compressive Imaging of Fourier Data. *SIAM J. Imaging Sci.* **11** (2018), 507–546.
68. W. Dahmen, W.-Q. Lim, G. Kutyniok, C. Schwab, and G. Welper. Adaptive Anisotropic Petrov-Galerkin Methods for First Order Transport Equations. *J. Comput. Appl. Math.* **340** (2018), 191–220.
69. J. Ma, M. März, S. Funk, J. Schulz-Menger, G. Kutyniok, T. Schaeffter, and C. Kolbitsch. Shearlet-based compressed sensing for fast 3D cardiac MR imaging using iterative reweighting. *Phys. Med. Biol.* **63** (2018), 235004.
70. F. Sureau, F. Voigtlaender, M. Wust, J.-L. Starck, and G. Kutyniok. Learning sparse representations on the sphere. *Astron. Astrophys.* **621** (2019), A73.
71. H. Bölcskei, P. Grohs, G. Kutyniok, and P. Petersen. Optimal Approximation with Sparsely Connected Deep Neural Networks. *SIAM J. Math. Data Sci.* **1** (2019), 8–45.
72. T. A. Bubba, G. Kutyniok, M. Lassas, M. März, W. Samek, S. Siltanen, and V. Srinivasan. Learning The Invisible: A Hybrid Deep Learning-Shearlet Framework for Limited Angle Computed Tomography. *Inverse Probl.* **35**, 2019.
73. H. Andrade-Loarca, G. Kutyniok, O. Öktem, and P. Petersen. Extraction of digital wavefront sets using applied harmonic analysis and deep neural networks. *SIAM J. Imaging Sci.* **12** (2019), 1936–1966.
74. I. Gühring, G. Kutyniok, and P. Petersen. Error bounds for approximations with deep ReLU neural networks in $W^{s,p}$ norms. *Anal. Appl.*, **18** (2020), 803–859.
75. G. Kutyniok. Discussion of “Nonparametric regression using deep neural networks with ReLU activation function”, *Ann. Stat.* **48** (2020), 1902–1905.
76. P. Grohs, G. Kutyniok, J. Ma, P. Petersen, and M. Raslan. Anisotropic Multiscale Systems on Bounded Domains. *Adv. Comput. Math.* **46** (2020), Article No.: 39.z
77. S. Wäldchen, J. Macdonald, S. Hauch, and G. Kutyniok. The Computational Complexity of Understanding Network Decisions. *J. Artif. Intell. Res.* **70** (2021), 351–387.

78. 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), 82–140.
79. M. Geist, P. Petersen, M. Raslan, R. Schneider, and G. Kutyniok. Numerical Solution of the Parametric Diffusion Equation by Deep Neural Networks. *J. Sci. Comput.* **88** (2021), Article number: 22.
80. H. Andrade-Loarca, G. Kutyniok, and O. Öktem. Shearlets as Feature Extractor for Semantic Edge Detection: The Model-Based and Data-Driven Realm. *P. Roy. Soc. A* **476** (2020), Article ID:20190841.
81. L. Oala, C. Hei, J. Macdonald, M. März, G. Kutyniok, and W. Samek. Detecting Failure Modes in Image Reconstructions with Interval Neural Network Uncertainty. *Int. J. Comput. Ass. Red.* **16** (2021), 2089–2097.
82. A. Hashemi, C. Cai, G. Kutyniok, K.-R. Müller, S.S. Nagarajan, and S. Haufe. Unification of Sparse Bayesian Learning Algorithms for Electromagnetic Brain Imaging with the Majorization Minimization Framework. *NeuroImage* **239** (2021), 118309.
83. R. Levie, C. Yapar, G. Kutyniok, and G. Caire. RadioUNet: Fast Radio Map Estimation with Convolutional Neural Networks. *IEEE T. Wirel. Commun.* **20** (2021), 4001–4015.
84. R. Levie, W. Huang, L. Bucci, M. M. Bronstein, and G. Kutyniok. Transferability of Spectral Graph Convolutional Neural Networks. *J. Mach. Learn. Res.* **22** (2021), 12462–12520.
85. G. Kutyniok, P. Petersen, M. Raslan, and R. Schneider. A Theoretical Analysis of Deep Neural Networks and Parametric PDEs. *Constr. Approx.* **55** (2022), 73–125.
86. V. Tiep Do, R. Levie, and G. Kutyniok. Analysis of simultaneous inpainting and geometric separation based on sparse decomposition. *Anal. Appl.* **20** (2022), 303–352.
87. R. Gribonval, G. Kutyniok, M. Nielsen, and F. Voigtlaender. Approximation spaces of deep neural networks. *Constr. Approx.* **55** (2022), 259–367.
88. H. Andrade-Loarca, G. Kutyniok, O. Öktem, and P. Petersen. Deep Microlocal Reconstruction for Limited-Angle Tomography. *Appl. Comput. Harmon. Anal.* **59** (2022), 155–197.
89. R. Levie, H. Avron, and G. Kutyniok. Quasi Monte Carlo Time-Frequency Analysis. *J. Math. Anal. Appl.* **518** (2023), 126732.
90. S. Maskey, R. Levie, and G. Kutyniok. Transferability of Graph Neural Networks: an Extended Graphon Approach. *Appl. Comput. Harmon. Anal.* **63** (2023), 48–83.
91. E. Kasneci, K. Sessler, S. Küchemann, M. Bannert, D. Dementieva, F. Fischer, U. Gasser, G. Groh, S. Günnemann, E. Hüllermeier, S. Krusche, G. Kutyniok, T. Michaeli, C. Nerdel, J. Pfeffer, O. Poquet, M. Sailer, A. Schmidt, T. Seidel, M. Stadler, J. Weller, J. Kuhn, G. Kasneci. ChatGPT for Good? On Opportunities and Challenges of Large Language Models for Education. *Learning & Individual Differences* **103** (2023), 102274.
92. C. Yapar, R. Levie, G. Kutyniok, and G. Caire. Real-time Outdoor Localization Using Radio Maps: A Deep Learning Approach. *IEEE Wirel. Commun.* **22** (2023), 9703–9717.
93. H. Boche, A. Fono, and G. Kutyniok. Limitations of Deep Learning for Inverse Problems on Digital Hardware. *IEEE Trans. Inform. Theory* **69** (2023), 7887–7908.
94. C. Yapar, F. Jaensch, R. Levie, G. Kutyniok, G. Caire. Overview of the First Pathloss Radio Map Prediction Challenge. *IEEE Open J. Sig. Proc.* **5** (2024), 948–963.

95. Y. Lee, H. Boche, and G. Kutyniok. Computability of Optimizers. *IEEE Trans. Inform. Theory* **70** (2024), 2967–2983.
96. Y. N. Böck, H. Boche, F. H. P. Fitzek and G. Kutyniok. Computing-Model and Computing-Hardware Selection for ICT Under Societal and Judicial Constraints, *IEEE Access* **12** (2024), 197412–197422.
97. P. Scholl, M. Iskandar, S. Wolf, J. Lee, A. Bacho, A. Dietrich, A. Albu-Schäffer, G. Kutyniok, Learning-based adaption of robotic friction models. *Robot. Comput. Integr. Manuf.* **89** (2024), 102780.
98. H. Boche, A. Fono, G. Kutyniok, Inverse problems are solvable on real number signal processing hardware, *Appl. Comput. Harmon. Anal.* **74** (2025), 101719.
99. S. Maskey, G. Kutyniok, R. Levie. Generalization Bounds for Message Passing Networks on Mixture of Graphons. *SIAM J. Math. Data Sci.* **7** (2025), 802–825
100. H. Boche, V. Fojtik, A. Fono, G. Kutyniok. Computability of Classification and Deep Learning: From Theoretical Limits to Practical Feasibility Through Quantization. *J. Fourier Anal. Appl.* **31** (2025), 35.
101. H. Boche, A. Fono, G. Kutyniok, Mathematical algorithm design for deep learning under societal and judicial constraints: The algorithmic transparency requirement, *Appl. Comput. Harmon. Anal.* **77** (2025), 101763.
102. S. Küchemann, K. Avila, Y. Dinc, C. Hortmann, N. Revenga, V. Ruf, N. Stausberg, S. Steinert, F. Fischer, M. Fischer, E. Kasneci, G. Kasneci, T. Kuhr, G. Kutyniok, S. Malone, M. Sailer, A. Schmidt, M. Stadler, J. Weller, J. Kuhn, On Opportunities and Challenges of Large Multimodal Foundation Models in Education, *npj Sci. Learn.* **10** (2025).
103. C. Bülte, P. Scholl, G. Kutyniok. Probabilistic neural operators for functional uncertainty quantification. *Trans. Mach. Learn. Res.*, to appear.

Refereed Conference Proceedings

1. G. Kutyniok. Computation of the density of weighted wavelet systems. In *Wavelets X* (San Diego, CA, 2003), SPIE Proc. **5207**, M. A. Unser, A. Aldroubi, and A. F. Laine, eds., SPIE, Bellingham, WA (2003), 393–404.
2. P.G. Casazza and G. Kutyniok. Frames of subspaces. In *Wavelets, Frames and Operator Theory* (College Park, MD, 2003), C. Heil, P. E. T. Jorgensen, and D. R. Larson, eds., Contemp. Math. **345**, Amer. Math. Soc., Providence, RI (2004), 87–113.
3. D. Labate, W-Q. Lim, G. Kutyniok, and G. Weiss. Sparse multidimensional representation using shearlets. In *Wavelets XI* (San Diego, CA, 2005), SPIE Proc. **5914**, M. Papadakis, A. F. Laine, and M. A. Unser, eds., SPIE, Bellingham, WA (2005), 254–262.
4. G. Ascensi and G. Kutyniok. Accumulative density. In *Wavelets XI* (San Diego, CA, 2005), SPIE Proc. **5914**, M. Papadakis, A. F. Laine, and M. A. Unser, eds., SPIE, Bellingham, WA (2005), 188–195.
5. P.G. Casazza, G. Kutyniok, and M.C. Lammers. Duality principles, localization of frames, and Gabor theory. In *Wavelets XI* (San Diego, CA, 2005), SPIE Proc. **5914**, M. Papadakis, A. F. Laine, and M. A. Unser, eds., SPIE, Bellingham, WA (2005), 389–398.
6. R. Balan, P.G. Casazza, D. Edidin, and G. Kutyniok. Decompositions of frames and a new frame identity. In *Wavelets XI* (San Diego, CA, 2005), SPIE Proc. **5914**, M. Papadakis, A. F. Laine, and M. A. Unser, eds., SPIE, Bellingham, WA (2005), 379–388.

7. K. Guo, G. Kutyniok, and D. Labate. Sparse Multidimensional Representations using Anisotropic Dilation and Shear Operators. In *Wavelets and Splines* (Athens, GA, 2005), G. Chen and M. J. Lai, eds., Nashboro Press, Nashville, TN (2006), 189–201.
8. P. G. Casazza, G. Kutyniok, S. Li, and C. J. Rozell. Modeling Sensor Networks with Fusion Frames. In *Wavelets XII* (San Diego, CA, 2007), 67011M-1–67011M-11, SPIE Proc. **6701**, D. Van De Ville, V. K. Goyal, and M. Papadakis, eds., SPIE, Bellingham, WA (2007).
9. G. Kutyniok and T. Sauer. From Wavelets to Shearlets and back again. In *Approximation Theory XII* (San Antonio, TX, 2007), M. Neamtu and L. Schumaker, eds., Nashboro Press, Nashville, TN (2008), 201–209.
10. C. Heil and G. Kutyniok. Convolution and Wiener amalgam spaces on the affine group. In *Recent Advances in Computational Science* (Beijing, China, 2005), P. E. T. Jorgensen, X. Shen, C.-W. Shu, and N. Yan, eds., World Scientific, Singapore (2008), 209–217.
11. P. G. Casazza and G. Kutyniok. Robustness of Fusion Frames under Erasures of Subspaces and of Local Frame Vectors. In *Radon transforms, geometry, and wavelets* (New Orleans, LA, 2006), E. L. Grinberg, D. Larson, P.E.T. Jorgensen, P. Massopust, G. Olafsson, E.T. Quinto, and B. Rubi, eds., Contemp. Math. **464**, Amer. Math. Soc., Providence, RI, 2008, 149–160.
12. A. Pezeshki, G. Kutyniok, and A. R. Calderbank. Fusion frames and Robust Dimension Reduction. *42nd Annual Conference on Information Sciences and Systems (CISS)* (Princeton University, NJ, 2008), 2008, 264–268.
13. D. L. Donoho and G. Kutyniok. Analysis of ℓ_1 Minimization in the Geometric Separation Problem. *42nd Annual Conference on Information Sciences and Systems (CISS)* (Princeton University, NJ, 2008), 2008, 274–279.
14. D. L. Donoho and G. Kutyniok. Geometric Separation using a Wavelet-Shearlet Dictionary. *SampTA '09* (Marseille, France, 2009), B. Torresani and L. Fesquet, eds., Proc., 2009.
15. B. G. Bodmann, P. G. Casazza, G. Kutyniok, and S. Senger. Error Correction for Erasures of Quantized Frame Coefficients. *SampTA '09* (Marseille, France, 2009), B. Torresani and L. Fesquet, eds., Proc., 2009.
16. B. G. Bodmann, G. Kutyniok and A. Pezeshki. Erasure-Proof Coding with Fusion Frames. *SampTA '09* (Marseille, France, 2009), B. Torresani and L. Fesquet, eds., Proc., 2009.
17. R. Calderbank, P. G. Casazza, A. Heinecke, G. Kutyniok, and A. Pezeshki. Constructing Fusion Frames with Desired Parameters. *Wavelets XIII* (San Diego, CA, 2009), 744612-1–744612-10, SPIE Proc. **7446**, D. Van De Ville, V. K. Goyal, and M. Papadakis, eds., SPIE, Bellingham, WA, 2009.
18. G. Kutyniok, M. Shahram, and D. L. Donoho. Development of a Digital Shearlet Transform Based on Pseudo-Polar FFT. *Wavelets XIII* (San Diego, CA, 2009), 74460B-1–74460B-13 SPIE Proc. **7446**, D. Van De Ville, V. K. Goyal, and M. Papadakis, eds., SPIE, Bellingham, WA, 2009.
19. B. G. Bodmann, P. G. Casazza, G. Kutyniok, and S. Senger. A Low Complexity Replacement Scheme for Erased Frame. *Wavelets XIII* (San Diego, CA, 2009), 74460O-1–74460O-10, SPIE Proc. **7446**, D. Van De Ville, V. K. Goyal, and M. Papadakis, eds., SPIE, Bellingham, WA, 2009.
20. B. G. Bodmann and G. Kutyniok. Erasure-Proof Transmissions: Fusion Frames meet Coding Theory. *Wavelets XIII* (San Diego, CA, 2009), 74460P-1–74460P-11, SPIE Proc.

- 7446**, D. Van De Ville, V. K. Goyal, and M. Papadakis, eds., SPIE, Bellingham, WA, 2009.
21. P. Boufounos, G. Kutyniok, and H. Rauhut. Compressed Sensing for Fusion Frames. *Wavelets XIII* (San Diego, CA, 2009), 744614-1–744614-11, SPIE Proc. **7446**, D. Van De Ville, V. K. Goyal, and M. Papadakis, eds., SPIE, Bellingham, WA, 2009.
 22. B. Boufounos, G. Kutyniok, and H. Rauhut. Average Case Analysis of Sparse Recovery from Combined Fusion Frame Measurements. *43rd Annual Conference on Information Sciences and Systems (CISS)* (Princeton University, NJ, 2010), 2010.
 23. B. G. Bodmann, P. G. Casazza, and G. Kutyniok. Upper and Lower Redundancy of Finite Frames. *43rd Annual Conference on Information Sciences and Systems (CISS)* (Princeton University, NJ, 2010), 2010.
 24. G. Kutyniok and W.-Q Lim. Shearlets on Bounded Domains. *Approximation Theory XIII (San Antonio, TX, 2010)*, Springer Proc. Math. 13, 187–206, Springer, 2012.
 25. G. Kutyniok, J. Lemvig, and W.-Q Lim. Compactly Supported Shearlets. *Approximation Theory XIII (San Antonio, TX, 2010)*, Springer Proc. Math. 13, 163–186, Springer, 2012.
 26. D. L. Donoho, G. Kutyniok, M. Shahram, and X. Zhuang. A Rational Design of a Digital Shearlet Transform. *SampTA'11* (Singapore, 2011), Proc., 2011.
 27. P. G. Casazza, A. Heinecke, and G. Kutyniok. Optimally Sparse Fusion Frames: Existence and Construction. *SampTA'11* (Singapore, 2011), Proc., 2011.
 28. B. G. Bodmann, P. G. Casazza, and G. Kutyniok. A Quantitative Notion of Redundancy and its Applications. *SampTA'11* (Singapore, 2011), Proc., 2011.
 29. G. Kutyniok, J. Lemvig, and W.-Q Lim. Optimally Sparse Approximations of Multivariate Functions Using Compactly Supported Shearlet Frames. *SampTA'11* (Singapore, 2011), Proc., 2011.
 30. G. Kutyniok and W.-Q Lim. Image Separation using Wavelets and Shearlets. *Curves and Surfaces* (Avignon, France, 2010), Lecture Notes in Computer Science, 416–430, Springer, 2010.
 31. E. J. King, G. Kutyniok, and X. Zhuang. Analysis of Data Separation and Recovery Problems using Clustered Sparsity. *Wavelets and Sparsity XIV* (San Diego, CA, 2009), 813818-1–813818-11, SPIE Proc. **8138**, M. Papadakis, D. Van De Ville, V.K. Goyal, eds., SPIE, Bellingham, WA, 2011.
 32. B. G. Bodmann, G. Kutyniok, and X. Zhuang. Coarse Quantization with the Fast Digital Shearlet Transform. *Wavelets and Sparsity XIV* (San Diego, CA, 2009), 8138OZ-1–8138OZ-10, SPIE Proc. **8138**, M. Papadakis, D. Van De Ville, V.K. Goyal, eds., SPIE, Bellingham, WA, 2011.
 33. G. Kutyniok, K. Okoudjou and F. Philipp. Perfect Preconditioning of Frames by a Diagonal Operator. 10th International Conference on Sampling Theory and Applications (Bremen, Germany, 2013), 85–88, Eurasip, 2013.
 34. H. Boche, M. Guillemand, G. Kutyniok, and F. Philipp. Signal Analysis with Frame Theory and Persistent Homology. 10th International Conference on Sampling Theory and Applications (Bremen, Germany, 2013), 309–331, Eurasip, 2013.
 35. F. Krahmer, G. Kutyniok, and J. Lemvig. Spectral properties of dual frames. 10th International Conference on Sampling Theory and Applications (Bremen, Germany, 2013), 493–496, Eurasip, 2013.

36. H. Lakshman, W.-Q Lim, H. Schwarz, D. Marpe, G. Kutyniok, and T. Wiegand. Image Interpolation using Shearlet Based Sparsity Priors. IEEE International Conference on Image Processing (ICIP 2013), 655–659, IEEE, 2013.
37. E. King, G.Kutyniok, and W.-Q Lim. Image Inpainting: Theoretical Analysis and Comparison of Algorithms. Wavelets and Sparsity XV (San Diego, CA, 2013), 885802-1–885802-11, SPIE Proc. **8858**, M. Papadakis, D. Van De Ville, V.K. Goyal, eds., SPIE, Bellingham, WA, 2013.
38. S. Keiper, G.Kutyniok, P. Grohs, and M. Schäfer. α -Molecules: Curvelets, Shearlets, Ridgelets, and Beyond. Wavelets and Sparsity XV (San Diego, CA, 2013), 885804-1–885804-12, SPIE Proc. **8858**, M. Papadakis, D. Van De Ville, V.K. Goyal, eds., SPIE, Bellingham, WA, 2013.
39. G. Kutyniok, K. A. Okoudjou, and F. Philipp. Preconditioning of Frames. Wavelets and Sparsity XV (San Diego, CA, 2013), G88580-1–G88580-8, SPIE Proc. **8858**, M. Papadakis, D. Van De Ville, V.K. Goyal, eds., SPIE, Bellingham, WA, 2013.
40. H. Boche, M. Guillemard, G. Kutyniok, and F. Philipp. Signal Recovery from Thresholded Frame Measurements. Wavelets and Sparsity XV (San Diego, CA, 2013), D88580-1–D88580-7, SPIE Proc. **8858**, M. Papadakis, D. Van De Ville, V.K. Goyal, eds., SPIE, Bellingham, WA, 2013.
41. G. Kutyniok, K. Okoudjou, and F. Philipp. Scalable Frames and Convex Geometry. In *Spectra of Wavelets, Tilings, and Frames* (Boulder, CO, 2012), V. Furst, K. Kornelsen, and E. Weber, eds., Contemp. Math. **345**, Amer. Math. Soc., Providence, RI (2013), 19–32.
42. S. Keiper, G.Kutyniok, P. Grohs, and M. Schäfer. Parabolic Molecules: Curvelets, Shearlets, and Beyond. In *Approximation Theory XIV* (San Antonio, TX, 2013), L.L. Schumaker and G. E. Fasshauer, eds., Springer Proc. Math. (2014), 141–172.
43. G. Kutyniok, V. Paternostro, and F. Philipp. Perturbations of Fusion Frames and the Effect on Their Canonical Dual. Wavelets and Sparsity XVI (San Diego, CA, 2015), 95970S–95977S, SPIE Proc. **9597**, M. Papadakis, D. Van De Ville, V.K. Goyal, eds., SPIE, Bellingham, WA, 2015.
44. D. Mücke-Herzberg, P. Abellan, M. Sarahan, I. Godfrey, Z. Saghi, R. Leary, A. Stevens, J. Ma, G. Kutyniok, F. Azough, R. Freer, P. Midgley, N. Browning, and Q. Ramasse. A Compressive Sensing based acquisition design for quantitative ultra-low dose high-resolution imaging and spectroscopy in the STEM. Proceedings of the European Microscopy Congress, 2016.
45. H. Bölcskei, P. Grohs, G. Kutyniok, and P. Petersen. Memory-Optimal Neural Network Approximation. Wavelets and Sparsity XVII (San Diego, CA, 2017), 103940Q, SPIE Proc. **10394**, Y. M. Lu, D. Van De Ville, and M. Papadakis, eds., SPIE, Bellingham, WA, 2017.
46. S. Keiper, G. Kutyniok, D. Lee, and G. Pfander. Reconstruction of finite-valued sparse signals. Wavelets and Sparsity XVII (San Diego, CA, 2017), 1039415, SPIE Proc. **10394**, Y. M. Lu, D. Van De Ville, and M. Papadakis, eds., SPIE, Bellingham, WA, 2017.
47. G. Wunder, I. Roth, M. Barzegar, A. Flinth, S. Haghighatshoar, G. Caire, and G. Kutyniok. Hierarchical Sparse Channel Estimation for Massive MIMO. 22nd International ITG Workshop on Smart Antennas (WSA 2018), March 14-16, 2018 in Bochum, Germany.

48. R. Levie, W. Huang, L. Bucci, M. Bronstein, and G. Kutyniok. Transferability of Spectral Graph Convolutional Neural Networks. Conference on Neural Information Processing Systems (NeurIPS), Workshop on Graph Representation Learning, 2019.
49. R. Levie, E. Isufi, and G. Kutyniok. On the Transferability of Spectral Graph Filters. Sampling Theory and Applications Conference (SampTA), 2019.
50. A. Goeßmann, M. Götte, I. Roth, R. Sweke, G. Kutyniok, and J. Eisert. Tensor Network Approaches for Data-Driven Identification of Non-Linear Dynamical Laws. Conference on Neural Information Processing Systems (NeurIPS), Workshop on Quantum Tensor Networks in Machine Learning, 2020.
51. C. Heiß, R. Levie, C. Resnick, G. Kutyniok, and J. Bruna. In-Distribution Interpretability for Challenging Modalities. International Conference on Machine Learning (ICML), Workshop on Interpretability for Scientific Discovery, 2020.
52. J. Macdonald, S. Wäldchen, S. Hauch, and G. Kutyniok. Explaining Neural Network Decisions Is Hard. International Conference on Machine Learning (ICML), Workshop on Extending Explainable AI Beyond Deep Models and Classifiers, 2020.
53. R. Levie, C. Yapar, G. Kutyniok, and G. Caire. Pathloss Prediction using Deep Learning with Applications to Cellular Optimization and Efficient D2D Link Scheduling. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), 2020.
54. L. Oala, C. Heiss, J. Macdonald, M. März, G. Kutyniok, and W. Samek. Detecting Failure Modes in Image Reconstruction with Interval Neural Network Uncertainty. International Conference on Machine Learning (ICML), Workshop on Uncertainty & Robustness in Deep Learning, 2020 (**Spotlight Paper**).
55. M. Seleznova and G. Kutyniok. Analyzing Finite Neural Networks: Can We Trust Neural Tangent Kernel Theory? International Conference on Mathematical and Scientific Machine Learning (MSML), 2021.
56. M. Seleznova and G. Kutyniok. Neural Tangent Kernel Beyond the Infinite-Width Limit: Effects of Depth and Initialization, International Conference on Machine Learning (ICML), 2022 (Spotlight Paper).
57. S. Kolek, D. A. Nguyen, R. Levie, J. Bruna, and G. Kutyniok. Cartoon Explanations of Image Classifiers, European Conference on Computer Vision (ECCV), 2022 (**Oral Presentation**).
58. C. Yaper, R. Levie, G. Kutyniok, and G. Caire. LOCUNET: Fast Urban Positioning Using Radio Maps and Deep Learning, International Conference on Acoustics, Speech, and Signal Processing (ICASSP), 2022.
59. S. Maskey, G. Kutyniok, and R. Levie. Generalization in graph neural networks on random graph models, 56th Asilomar Conference on Signals, Systems and Computers, 2022.
60. J. Hege, S. Kolek, and G. Kutyniok. Explaining Image Classifiers with Wavelets, IEEE Visualization Conference (VIS), Workshop on Visualization for AI Explainability, 2022.
61. C. Koke and G. Kutyniok. Graph Scattering beyond Wavelet Shackles, Conference on Neural Information Processing Systems (NeurIPS), 2022.
62. S. Maskey, R. Levie, Y. Lee, and G. Kutyniok. Generalization Analysis of Message Passing Neural Networks on Large Random Graphs, Conference on Neural Information Processing Systems (NeurIPS), 2022.

63. Y. Zhou, G. Kutyniok, and B. Ribeiro. OOD Link Prediction Generalization Capabilities of Message-Passing GNNs in Larger Test Graphs, Conference on Neural Information Processing Systems (NeurIPS), 2022.
64. S. Kolek, R. Windesheim, H.A. Loarca, G. Kutyniok, and R. Levie. Explaining Image Classifiers with Multiscale Directional Image Representation, Conference on Computer Vision and Pattern Recognition (CVPR), 2023.
65. D. Nguyen, R. Levie, J. Lienen, G. Kutyniok, and E. Hüllermeier. Memorization-Dilation: Modeling Neural Collapse Under Noise, International Conference on Learning Representations (ICLR), 2023.
66. R. Paolino, A. Bojchevski, S. Günnemann, G. Kutyniok, and R. Levie. Unveiling the Sampling Density in Non-Uniform Geometric Graphs, International Conference on Learning Representations (ICLR), 2023.
67. S. Alberti, N. Dern, L. Thesing, and G. Kutyniok. Sumformer: Universal Approximation for Efficient Transformers, International Conference on Machine Learning (ICML), Workshop on Topology, Algebra, and Geometry for Machine Learning, 2023.
68. H. T. M. Kussaba, A. Swikir, F. Wu, A. Demerdjieva, G. Kutyniok, and S. Haddadin. Learning Optimal Controllers: A Dynamical Motion Primitive Approach, World Congress of the International Federation of Automatic Control (IFOC), 2023.
69. G. Mukobi, P. Chatain, S. Fong, R. Windesheim, G. Kutyniok, K. Bhatia, and S. Alberti. SuperHF: Supervised Iterative Learning from Human Feedback. Conference on Neural Information Processing Systems (NeurIPS), Workshop on Socially Responsible Language Modelling Research, 2023.
70. M. Singh, A. Fono, and G. Kutyniok. Expressivity of Spiking Neural Networks. Conference on Neural Information Processing Systems (NeurIPS), Workshop on Unifying Representations in Neural Models, 2023.
71. C. Yapar, F. Jaensch, R. Levie, G. Kutyniok, and G. Caire. Overview Of The Urban Wireless Localization Competition. 33rd IEEE International Workshop on Machine Learning for Signal Processing (MLSP), 2023.
72. P. Scholl, A. Bacho, H. Boche and G. Kutyniok. The Uniqueness Problem of Physical Law Learning. International Conference on Acoustics, Speech, and Signal Processing (ICASSP), 2023.
73. C. Yaper, F. Jaensch, R. Levie, G. Kutyniok, and G. Caire. The First Pathloss Radio Map Prediction Challenge, International Conference on Acoustics, Speech, and Signal Processing (ICASSP), 2023.
74. M. Selezneva, D. Weitzner, R. Giryes, G. Kutyniok, H. Chou. Neural (Tangent Kernel) Collapse, Conference on Neural Information Processing Systems (NeurIPS), 2023.
75. S. Maskey, R. Paolino, A. Bacho, and G. Kutyniok. A Fractional Graph Laplacian Approach to Oversmoothing, Conference on Neural Information Processing Systems (NeurIPS), 2023.
76. S. Alberti, S. N. Dern, L. Thesing, and G. Kutyniok. Sumformer: Universal approximation for efficient transformers., Conference on Neural Information Processing Systems (NeurIPS), Workshop on Topological, Algebraic and Geometric Learning, 2023.

77. R. Paolino, S. Maskey, P. Welke, G. Kutyniok. Weisfeiler and Leman Go Loopy: A New Hierarchy for Graph Representational Learning. International Conference on Learning Representations (ICLR), Workshop on Bridging the Gap Between Practice and Theory in Deep Learning, 2024.
78. M. Singh, A. Fono, G. Kutyniok, Expressivity of Spiking Neural Networks. Conference on Neural Information Processing Systems (NeurIPS) Workshop on Unifying Representations in Neural Models, 2024.
79. C. Bülte, P. Scholl, G. Kutyniok. Probabilistic predictions with Fourier neural operators. Conference on Neural Information Processing Systems (NeurIPS), Workshop on Bayesian Decision-making and Uncertainty, 2024.
80. K. Bieker, H. Kussaba, P. Scholl, J. Jung, A. Swikir, S. Haddadin, G. Kutyniok. Compositional Construction of Barrier Functions for Switched Impulsive Systems. IEEE 63rd Conference on Decision and Control (CDC), 2024.
81. R. Paolino*, S. Maskey*, P. Welke, G. Kutyniok. Weisfeiler and Leman Go Loopy: A New Hierarchy for Graph Representational Learning. Conference on Neural Information Processing Systems (NeurIPS), 2024 (**Oral Presentation**).
82. H. Hauger, P. Scholl, G. Kutyniok. Robust identifiability for symbolic recovery of differential equations. International Conference on Acoustics, Speech, and Signal Processing (ICASSP), 2025.
83. C. Bülte, S. Maskey, P. Scholl, J. von Berg, G. Kutyniok. Graph Neural Networks For Enhancing Ensemble Forecasts Of Extreme Rainfall. International Conference on Learning Representations (ICLR), Workshop on Tackling Climate Change with Machine Learning, 2025.
84. L. Yang, Y. Bai, G. Eskandar, F. Shen, M. Altillawi, D. Chen, S. Majumder, S. Liu, G. Kutyniok, A. Valada. RoboEnvision: A Long-Horizon Video Generation Model for Multi-Task Robot Manipulation. IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2025.
85. Y. Bai, L. Yang, G. Eskandar, F. Shen, D. Chen, M. Altillawi, Z. Liu, G. Kutyniok. RoboSwap: A GAN-driven Video Diffusion Framework For Unsupervised Robot Arm Swapping IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2025.
86. P. Scholl, K. Bieker, H. Hauger, G. Kutyniok. ParFam – (Neural Guided) Symbolic Regression via Continuous Global Optimization. International Conference on Learning Representations (ICLR), 2025.

Books

1. G. Kutyniok. Affine density in wavelet analysis. *Lecture Notes in Mathematics* **1914**, Springer-Verlag, Berlin, 2007, 142 + xii pp., ISBN: 978-3-540-72916-7.
2. Y. Eldar and G. Kutyniok, eds., Compressed Sensing: Theory and Applications. Cambridge University Press, 2012.
3. G. Kutyniok and D. Labate, eds., Shearlets: Multiscale Analysis for Multivariate Data. Birkhäuser-Springer, 2012.
4. P.G. Casazza and G. Kutyniok, eds., Finite Frames: Theory and Applications. Birkhäuser-Springer, 2012.

5. H. Boche, R. Calderbank, G. Kutyniok, and J. Vybiral, eds., *Compressed Sensing and its Applications: MATHEON Workshop 2013*. Birkhäuser-Springer, 2015.
6. H. Boche, G. Caire, R. Calderbank, M. März, G. Kutyniok, and R. Mathar, eds., *Compressed Sensing and its Applications: Second International MATHEON Conference 2015*. Birkhäuser-Springer, 2017.
7. H. Boche, G. Caire, R. Calderbank, G. Kutyniok, R. Mathar, and P. Petersen, eds., *Compressed Sensing and Its Applications: Third International MATHEON Conference 2017*. Birkhäuser-Springer, 2019.
8. P. Grohs and G. Kutyniok, eds., *Mathematical Aspects of Deep Learning*. Cambridge University Press, 2022.
9. G. Kutyniok, H. Rauhut, and R. J. Kunsch, eds., *Compressed Sensing in Information Processing*. Springer, 2023.

Book Chapters

1. P. G. Casazza and G. Kutyniok. Fusion Frames. In: *Finite Frames: Theory and Applications*, 437–478, Birkhäuser Boston, 2012.
2. P. G. Casazza, G. Kutyniok, and F. Philipp. Introduction to Finite Frame Theory. In: *Finite Frames: Theory and Applications*, 1–53, Birkhäuser Boston, 2012.
3. G. Kutyniok. Data Separation by Sparse Representations. In: *Compressed Sensing: Theory and Applications*, 485–514, Cambridge University Press, 2012.
4. M. Davenport, M. Duarte, Y. Eldar, and G. Kutyniok. Introduction to Compressed Sensing. In: *Compressed Sensing: Theory and Applications*, 1–64, Cambridge University Press, 2012.
5. G. Kutyniok and D. Labate. Introduction to Shearlets. In: *Shearlets: Multiscale Analysis for Multivariate Data*, 1–38, Birkhäuser Boston, 2012.
6. G. Kutyniok, W.-Q Lim, and X. Zhuang. Digital Shearlet Transforms. In: *Shearlets: Multiscale Analysis for Multivariate Data*, 239–282, Birkhäuser Boston, 2012.
7. G. Kutyniok, J. Lemvig, and W.-Q Lim. Shearlets and Optimally Sparse Approximations. In: *Shearlets: Multiscale Analysis for Multivariate Data*, 145–198, Birkhäuser Boston, 2012.
8. F. Sündermann, S. Lotter, W.-Q Lim, N. Golovyashkina, R. Brandt, and G. Kutyniok. Shearlet-analysis of cLSM images to extract morphological features of neurons. In: *Laser Scanning Microscopy and Quantitative Image Analysis of Neuronal Tissue*, L. Bakota, R. Brandt, eds., 293–304, Springer 2014.
9. W. Dahmen, C. Huang, G. Kutyniok, W.-Q Lim, C. Schwab, and G. Welper. Efficient Resolution of Anisotropic Structures. In: *Extraction of Quantifiable Information from Complex Systems*, 25–51, Springer, 2014.
10. F. Aurzada, A. Bley, A. Eisenblätter, H.-F. Geerdes, M. Guillemard, G. Kutyniok, F. Philipp, C. Rack, M. Scheutzow, and A. Werner. Mathematics for telecommunications. In: *MATHEON – Mathematics for Key Technologies*, EMS Publishing House (2014), 75–89.
11. H. Boche, R. Calderbank, G. Kutyniok, and J. Vybiral. A Survey of Compressed Sensing. In: *Compressed Sensing and its Applications*, 1–40, Birkhäuser Boston, 2015.
12. A. Flinth, A. Hashemi, and G. Kutyniok. Compressed Sensing: From Theory to Praxis. In: *Compressive Sensing of Earth Observations*, C.H. Chen, ed., Taylor and Francis 2017.

13. G. Kutyniok, M. März, and J. Ma. Mathematical Methods in Medical Image Processing. In: *Quantification of Biophysical Parameters by Medical Imaging*, I. Sack and T. Schäffter, eds., Springer 2017.
14. I. Gühring, M. Raslan, and G. Kutyniok. Expressivity of Deep Neural Networks. In: *Mathematical Aspects of Deep Learning*, Cambridge University Press, 2022.
15. S. Kolek, D. A. Nguyen, R. Levie, J. Bruna, and G. Kutyniok. A Rate-Distortion Framework for Explaining Black-box Model Decisions. In: *Springer LNAI Volume: xxAI – beyond explainable AI*, 2022.
16. G. Kutyniok. Shearlets: From Theory to Deep Learning. In: *Handbook of Mathematical Models and Algorithms in Computer Vision and Imaging*. K. Chen, C.-B. Schönlieb, X.-C. Tai, and L. Younes, Springer, 2023.
17. H. Boche, A. Fono, and G. Kutyniok, Rechenleistung rauf, Energiebedarf runter. In: *Physik - Erkenntnisse und Perspektiven*. Deutschen Physikalischen Gesellschaft e. V. (DPG), 2025.
18. Y. Lee, H. Boche, and G. Kutyniok. Computability of optimizers for AI and data science. In: *Handbook of Numerical Analysis*, Elsevier, 2025.

Invited Survey Papers/Book Reviews

1. A. Klein, G. Kutyniok, T. Sauer, and W. Skrandies. Wavelets in Neurophysiology. *Brain Topography* **20** (2007), 52–53.
2. G. Kutyniok. Time-frequency analysis. *Human Cognitive Neurophysiology* **1** (2008), 12–21.
3. G. Kutyniok. What is Applied Harmonic Analysis? *DMV Mitteilungen* **16** (2008), 78–84.
4. G. Kutyniok. Book Review of “Four Short Courses on Harmonic Analysis” *Jahresbericht der DMV* **113** (2011), 41–44.
5. G. Kutyniok. Theory and Applications of Compressed Sensing. *GAMM Mitteilungen* **36** (2013), 79–101.
6. G. Kutyniok. Compressed Sensing. *DMV Mitteilungen* **22** (2014), 24–29.
7. G. Kutyniok. Mit Mathematik die Datenflut bewältigen. *Die Zeit*, 2014.
8. G. Kutyniok. Geometric Multiscale Analysis: From Wavelets to Parabolic Molecules. *Int. Math. Nachrichten* **225** (2014), 1–16.
9. G. Kutyniok, W.-Q Lim, and G. Steidl. Shearlets: Theory and Applications. *GAMM-Mitteilungen* **37** (2014), 259–280.
10. G. Kutyniok. Shearlets. In: *Encyclopedia of Applied and Computational Mathematics*, B. Engquist et al., eds., Springer, 2016.
11. G. Kutyniok. Mit Mathematik die Datenflut beherrschen? In: *Alles Mathematik. Von Pythagoras zum CD-Player*, M. Aigner, E. Behrends, eds., 187–196, Springer, 2016.
12. G. Kutyniok, J. Liesen, and V. Mehrmann. G2S3 Participants Study Data Sparse Approximation and Algorithms. In: *SIAM News*, SIAM, Sept. 2017.
13. S. Bosse, G. Kutyniok, and R. Reisenhofer. Perceptual Image Quality Assessment by Haar Wavelet Similarity. In: *SIAM News*, SIAM, Oct. 2017.
14. G. Kutyniok, S. Levine, L. Ruthotto, and F. Sgallari. Imaging Science Community Meets in Bologna. In: *SIAM News*, SIAM, Aug. 2018.

15. M. Genzel and G. Kutyniok. Artificial Neural Networks In: *GAMM Rundbrief* **2** (2019), 12–20.
16. H. De Sterck, G. Kutyniok, J. Nagy, and E. Tadmor. Panelists Talk Machine Learning and the Future of Mathematics at ICIAM 2019 In: *SIAM News*, SIAM, 2019.
17. G. Kutyniok, A. Pinar, and J. A. Tropp. SIAM Conference on Mathematics of Data Science: A Conference Goes Virtual. In: *SIAM News*, SIAM, 2020.
18. J. Berner, P. Grohs, G. Kutyniok, P. Petersen. Die moderne Mathematik des tiefen Lernens. *DMV Mitteilungen* **29**, 2021.
19. G. Kutyniok. Zuverlässige Künstliche Intelligenz: Erfolge, Herausforderungen und Grenzen. In: *Digitale Welt* as Editorial, 4, 2022.
20. G. Kutyniok. An Introduction to the Mathematics of Deep Learning. In: *European Congress of Mathematics*, EMS Press, 2023.
21. G. Kutyniok. The Mathematics of Artificial Intelligence. In: *International Congress of Mathematicians*, EMS Press, 2023.
22. H. Boche, A. Fono, and G. Kutyniok. Fundamentale Grenzen der künstlichen Intelligenz aus mathematischer Sicht. In: *Sammelband “Grenzen Künstlicher Intelligenz”* (Markus Maier/Benjamin Rathgeber (Hrsg.)), Kohlhammer-Gruppe, 2025.
23. G. Kutyniok. The Mathematics of Reliable Artificial Intelligence. In: *SIAM News* **57**, 2025.
24. W. Samek, U. Schmid, J. Hoffart, D. Keim, G. Kutyniok, P. Schlunder, Whitepaper “Nachvollziehbare KI. Erklären, für wen, was und wofür”, *Plattform Lernende Systeme*, 2025.
25. S. Brüggewirth, A. Burchard, T. Fingscheidt, H. Hoos, K. Illgner, H. Junklewitz, A. Kaup, K. von Knop, J. Köhler, G. Kutyniok, R. Martin, D. Kolossa, S. Möller, R. Schlüter, D. Thulke, V. Schmitt, I. Siegert, V. Ziegler, Large Language Models are Transformers in Artificial Intelligence, Industry, Education, and Society, Positionspapier der *VDE ITG*, 2025.
26. G. Kutyniok. How Can Reliability of Artificial Intelligence Be Ensured? In: *Harvard Data Science Review* **7**, 2025.