Emily J. King

Junior Professor in Computational Data Analysis – University of Bremen

Research Interests: Pure & Applied Harmonic Analysis, Data Analysis, Frame Theory, Sparse & Redundant Representations, Signal & Image Processing

Education

Degrees

University of Maryland — College Park, MD, USA
Ph.D. in Mathematics — 9/2005–8/2009
"Wavelet and Frame Theory: Frame Bound Gaps, Generalized Shearlets, Grassmannian Fusion Frames, and p-adic Wavelets"
Advisors: Dr. John J. Benedetto and Dr. Wojciech Czaja
Oral Preliminary Exam: "Density of Gabor Systems," 2007
Written Exams: Analysis, Algebra, Topology, 2006
Language Exam: Russian, 2006

Texas A&M University — College Station, TX, USA
M.S. in Mathematics — 9/2004–8/2005
Advisor: Dr. David Larson

Texas A&M University — College Station, TX, USA
B.S. in Applied Mathematics — 9/2000–12/2003

Non-Degree Study

Foundation for the Advanced Education in the Sciences Graduate School — Bethesda, MD, USA
Computational Biology & Bioinformatics — 2/2010–12/2010

University of Maryland — College Park, MD, USA
Advanced Special Student - Bioengineering — 9/2009–12/2009

Budapest Semesters in Mathematics — Budapest, Hungary
Discrete Math & Number Theory — 2/2004–6/2004

University of Bremen · ZeTeM, FB 03 · Postfach 330 440 · 28334 Bremen · Germany
✉ king@math.uni-bremen.de ☎ +49 (421) 218 - 59894

Emily J. King

Positions

Current

Colorado State University — Fort Collins, CO, USA
Assistant Professor — 8/2019–

Previous

University of Bremen — Bremen, Germany
Junior Professor „Computational Data Analysis“ — 4/2014–7/2019
Associate, Zentrum für Technomathematik (Center for Industrial Mathematics)

University of Bremen — Bremen, Germany
Wissenschaftliche Mitarbeiterin (Postdoctoral Researcher), — 11/2013–3/2014
Zentrum für Technomathematik (Center for Industrial Mathematics)

Technical University of Berlin — Berlin, Germany
Humboldt Postdoctoral Fellow, FG Angewandte Funktionalanalysis — 3/2012–6/2013

Berlin Mathematical School — Berlin, Germany
Postdoctoral Faculty Member — 8/2012–6/2013

University of Bonn — Bonn, Germany
Humboldt Postdoctoral Fellow, Institute for Numerical Simulation — 10/2011–2/2012

Universität Osnabrück — Osnabrück, Germany
Humboldt Postdoctoral Fellow, Applied Analysis Group — 7/2011–9/2011

University of Maryland — College Park, MD, USA
Postdoctoral Research Associate, Norbert Wiener Center — 9/2009–6/2011

National Institutes of Health — Bethesda, MD, USA
Postdoctoral IRTA Fellow, Laboratory of Integrative and Medical Biophysics — 9/2009–2/2011

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Papers and Other Publications

Journal Papers and Preprints

1. Emily J. King, "Constructing Subspace Packings from Other Packings" (2019) https://arxiv.org/abs/1902.07145.

2. Emily J. King, "New Constructions and Characterizations of Flat and Almost Flat Grassmannian Fusion Frames," (2019) https://arxiv.org/abs/1612.05784.

3. Sören Dittmer, Emily J. King, and Peter Maass, "Singular Values for ReLU Layers" (2018) https://arxiv.org/abs/1812.02566.

4. Sören Schulze and Emily J. King, "Musical Instrument Separation on Shift-Invariant Spectrograms via Stochastic Dictionary Learning" (2018) https://arxiv.org/abs/1806.00273.

5. Emily J. King and Xiaoxian Tang, "New Upper Bounds for Equiangular Lines by Pillar Decomposition," (2016) https://arxiv.org/abs/1606.03259. Under minor revision.

6. Bernhard Bodmann and Emily J. King, "Optimal arrangements of classical and quantum states with limited purity" (2018) https://arxiv.org/abs/1811.11513. To appear, *Journal of the London Mathematical Society*.

7. Rafael Reisenhofer and Emily J. King, "Edge, Ridge, and Blob Detection with Symmetric Molecules" (2019) https://arxiv.org/abs/1901.09723. To appear, *SIAM Journal on Imaging Sciences*.

8. Matthew Fickus, John Jasper, Emily J. King, and Dustin G. Mixon, "Equiangular tight frames that contain regular simplices," *Linear Algebra and Applications*, **555** (2018): 98–138.

9. Emily J. King and Maria A. Skopina, "On biorthogonal p-adic wavelet bases," *Notes of Scientific Seminars of the St. Petersburg Department of the Steklov Mathematical Institute*, Russian Academy of Sciences, **455** (2017):67-83. (in Russian) English version *Journal of Mathematical Sciences*, **234**:2 (October 2018): 158–169, Springer.

10. Rafael Reisenhofer, Johannes Kiefer, Emily J. King, "Shearlet-based detection of flame fronts," *Experiments in Fluids*, 57 (2016): 41–55.

11. Wojciech Czaja and Emily J. King, "Anisotropic shearlet transforms for $L^2(\mathbb{R}^k)$," *Mathematische Nachrichten*, **287**.8–9 (June 2014): 903–916.

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12. Emily J. King, Gitta Kutyniok, and Xiaosheng Zhuang, "Analysis of Inpainting via Clustered Sparsity and Microlocal Analysis," *Journal of Mathematical Imaging and Vision*, **48**.2 (2014): 205–234.

13. Emily J. King, "Smooth Parseval frames for $L^2(\mathbb{R})$ and generalizations to $L^2(\mathbb{R}^d)$," *Int. J. Wavelets Multi*, **11**.6 (November 2013).

14. Wojciech Czaja and Emily J. King, "Isotropic shearlet analogs for $L^2(\mathbb{R}^k)$ and localization operators," *Numerical Functional Analysis and Optimization*, **33** (2012): 872–905.

15. Emily J. King and Maria A. Skopina, "Quincunx multiresolution analysis for $L^2(\mathbb{Q}_2^2)$," *p-Adic Numbers, Ultrametric Analysis, and Applications*, **2**.3 (September 2010): 222–231.

16. John J. Benedetto and Emily J. King, "Smooth functions associated with wavelet sets on $\mathbb{R}^d$, $d \geq 1$, and frame bound gaps," *Acta Appl. Math.*, **107**.1-3 (July 2009): 121–142.

Refereed Conference Proceedings and Reports

1. Emily J. King, "2- and 3-Covariant Equiangular Tight Frames" (2019) https://arxiv.org/abs/1901.10612. To appear, *Sampling Theory in Signal and Image Processing: Special Issue SampTA 2019*.

2. Martin Ehler, Julia Dobrosotskaya, Emily J. King, and Robert F. Bonner, "Quantification of Retinal Chromophores Through Autofluorescence Imaging to Identify Precursors of Age-Related Macular Degeneration," *Excursions in Harmonic Analysis: The February Fourier Talks at the Norbert Wiener Center*, Eds.: T. Andrews, R. Balan, J. J. Benedetto, W. Czaja, K. A. Okoudjou, Birkhäuser Basel (2013): 355–372.

3. Julia Dobrosotskaya, Martin Ehler, Emily J. King, Robert Bonner, and Wojciech Czaja, "Sparse Representations and Variational Methods in Retinal Image Processing," *IFMBE Proceedings Series:Intern. Fed. for Medical & Biological Engineering, 26th Southern Biomedical Engineering Conference (SBEC 2010)*, Springer (2010): 344–347.

4. Martin Ehler, Zigurts Majumdar, Emily J. King, Julia Dobrosotskaya, Emily Chew, Wai Wong, Denise Cunningham, Wojciech Czaja, and Robert F. Bonner, "High-Resolution Autofluorescence Imaging for Mapping Molecular Processes Within the Human Retina," *IFMBE Proceedings Series: Intern.Fed. for Medical & Biological Engineering, 26th Southern Biomedical Engineering Conference(SBEC 2010)*, Springer (2010): 361–364.

Abstract-Refereed Conference Proceedings and Reports

1. John Jasper, Emily J. King, and Dustin Mixon, "Game of Sloanes: Best Known Packings in Complex Projective Space," To appear *Wavelets and Sparsity XVIII, SPIE Proceedings*.

UNIVERSITY OF BREMEN · ZETEM, FB 03 · POSTFACH 330 440 · 28334 BREMEN · GERMANY
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2. Sören Schulze and Emily J. King, "A Frequency-Uniform and Pitch-Invariant Time-Frequency Representation." To appear *Proceedings in Applied Mathematics and Mechanics – 90th GAMM Annual Meeting*.

3. Emily J. King and James M. Murphy, "A theoretical guarantee for data completion via geometric separation," *Proceedings in Applied Mathematics and Mechanics*, **17**.1 (2018)

4. Emily J. King, "Algebraic and geometric spread in finite frames," *Wavelets and Sparsity XVI*, *SPIE Proceedings*, **9597** (2015).

5. Emily J. King, Rafael Reisenhofer, Johannes Kiefer, Wang-Q Lim, Zhen Li, and Georg Heygster, "Shearlet-Based Edge Detection: Flame Fronts and Tidal Flats," *Applications of Digital Image Processing XXXVIII*, *SPIE Proceedings*, **9599** (2015).

6. Emily J. King, Gitta Kutyniok, and Wang-Q Lim, "Image inpainting: theoretical analysis and comparison of algorithms," *Wavelets and Sparsity XV*, *SPIE Proceedings*, **8858** (2013).

7. Emily J. King, "Frame theory for locally compact abelian groups," *Wavelets and Sparsity XV*, *SPIE Proceedings*, **8858** (2013).

8. Emily J. King, Gitta Kutyniok, and Xiaosheng Zhuang, "Analysis of data separation and recovery problems using clustered sparsity," *Wavelets and Sparsity XIV*, *SPIE Proceedings*, **8138** (2011).

9. Martin Ehler, Julia Dobrosotskaya, Emily J. King, Wojciech Czaja, and Robert F. Bonner, "Modeling Photobleaching Kinetics to Map Local Variations in Rod Rhodopsin Density," *Medical Imaging 2011: Computer-Aided Diagnosis*, *SPIE Proceedings*, **7963**.

10. Julia Dobrosotskaya, Martin Ehler, Emily J. King, Robert F. Bonner, and Wojciech Czaja, "Modeling of the rhodopsin bleaching with variational analysis of retinal images," *Medical Imaging 2011: Image Processing*, *SPIE Proceedings*, **7962**.

Unrefereed Conference Proceedings and Reports

1. Emily J. King (joint work with Alex Fink, Cynthia Vinzant, and Shayne Waldron,), "Decomposing (equiangular) tight frames into (equiangular) tight frames for their spans," *Oberwolfach Reports – Applied Harmonic Analysis and Sparse Approximation*, **46** (2018): 29 – 32.

2. Emily J. King (joint work with Gitta Kutyniok and Xiaosheng Zhuang), "Analysis of Inpainting via Clustered Sparsity and Microlocal Analysis," *Oberwolfach Reports – Applied Harmonic Analysis and Sparse Approximation*, **29** (2012): 44 – 48.

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3. Emily J. King (joint work with Wojtek Czaja), "Shearlets and representation theory (and the Wick calculus)," *Oberwolfach Reports – Operator Algebras and Representation Theory: Frames, Wavelets and Fractals*, **8**.1 (2011): 961 – 963.

Other Publications and Papers

1. Emily J. King, "A Matricial Algorithm for Polynomial Refinement," http://arxiv.org/abs/1110.6061 (2011)
2. Olga I. Glazunova, *Rush to Russian*, 2nd ed., English-language editor: Emily J. King, Izdatel'ckijdom "Mirs" (Publishing House Mirs), St. Petersburg (2010): 304 pages. ISBN 978-5-91395-048-2
3. Emily J. King, "A Journal of the Budapest Semesters in Mathematics," *MAA: Math Horizons*, **14** (September 2006).
4. Emily J. King, "Grassmannian fusion frames," https://arxiv.org/abs/1004.1086 (2013)
5. Emily J. King, Review of *Codes and Ciphers: Julius Caesar, the Enigma, and the Internet* by Robert Churchhouse, *MAA: Math Horizons*, **11** (April 2004).

Fellowships, Awards, and Grants

Grants

- Co-Spokesperson / Project Leader: Helmholtz School for Marine Data Science (MarDATA), € 6,000,000.00 (total program), Helmholtz Association, 2019 – [left 2019]
- Project Leader: Graduiertenkolleg "Research Training Group π^3: Parameter Identification – Analysis, Algorithms, Application," € 208,837.50 (my portion, less overhead costs), Deutsche Forschungsgemeinschaft, 2016 – [left 2019]
- Coauthor/PI: Explorationsprojekt "Hilbert Space Frames and Algebraic Geomery" with Eva-Maria Feichtner, € 245,535, Zentrale Forschungsförderung der University of Bremen, 2014 – 2016
- Author: AMS-Simons Travel Grant, $4000, July 1, 2013 – June 30, 2015
- Author: Jacob K. Goldhaber Travel Grant, $600, Graduate School, University of Maryland, June 2009
- Author: Kaplan Travel Funds, $600, University of Maryland, Alumni Association, Summer 2009
- Coauthor: MAA-Tensor Grant, $1500 for Women in Mathematics at the University of Maryland, Spring 2009

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Fellowships & Scholarships

- Humboldt Postdoctoral Research Fellowship, July 2011 – June 2013
- IRTA Postdoctoral Fellow, National Institutes of Health, September 2009 – February 2011
- Norbert Wiener Center Summer Research Assistantship, University of Maryland, Summer 2009
- Ann G. Wylie Dissertation Fellow, University of Maryland, August 2008 – December 2008
- GAANN Fellow, University of Maryland, August 2005 – August 2008
- Lechner Scholar, Texas A&M University, August 2000 – December 2004
- National Merit Scholar, Texas A&M University, August 2000 – December 2003
- Academic Achievement Scholar, Texas A&M Mathematics, August 2002 – December 2003
- NSF-VIGRE Fellow, Texas A&M University, Summer 2002, Summer 2003
- Mechanical Engineering Scholar, Texas A&M University, August 2000 – May 2001
- Directors Excellence Scholar, Texas A&M University, August 2000 – May 2001

Prizes & Awards

- Seymour Goldberg Writing Competition Winner, University of Maryland, March 2007
- Rank 403.5/3615, Putnam Exam, Fall 2003
- 4th place winner, US National Collegiate Mathematics Championship, MathFest, Boulder, Colorado, USA, August 2003
- Pi Mu Epsilon/AMS Outstanding Student Talk, MathFest, Boulder, Colorado, USA, August 2003

Conferences, Workshops, & Seminars

Invited Conference and Workshop Presentations

- "Algebraic and Geometric Spread of Linear Measurements in Applications," Keynote Address, Wavelets & Sparsity XVIII, SPIE Optics & Photonics 2019, San Diego, CA, USA, August 11–15, 2019
- "2- and 3-Covariant Equiangular Tight Frames," SampTA 2019, Bordeaux, Fracce, July 8–12, 2019

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- "Edge, ridge, and blob detection with symmetric molecules," AWM Research Symposium, Rice University, Houston, TX, USA, April 6–7, 2019
- "Negative Cliques in Sets of Equiangular Lines," 7th International Conference on Computational Harmonic Analysis, Vanderbilt University, Nashville, TN, USA, May 14–18, 2018
- "Fourier Analysis on Groups and Grassmannian Packings," Spring Mini Courses in Analysis and Geometry, Louisiana State University, Baton Rouge, Louisiana, USA, February 8–11, 2018
- "Difference Sets and Grassmannian Packings," International Workshop on Wavelets, Frames and Applications III, Kirori Mal College, University of Delhi, Delhi, India, December 14–20, 2017
- "Combinatorial Frame Design," AFG Summer Party, TU Berlin, Berlin, Germany, August 25–26, 2016
- "Optimal Frames," Section on Mathematical Signal and Image Processing, Joint Annual Meeting of GAMM and DMV, Braunschweig, Germany, March 7–11, 2016
- "Algebraic and Geometric Spread in Finite Frames," Applied and Computational Harmonic Analysis Section, DMV-Jahrestagung, Hamburg, Germany, September 21–25, 2015
- "Algebraic and geometric spread in finite frames," Wavelets & Sparsity XVI, SPIE Optics & Photonics 2015, San Diego, CA, USA, August 9–13, 2015
- "Shearlet-Based Edge Detection: Flame Fronts and Tidal Fronts," GAMM 86th Annual Meeting of the International Association of Applied Mathematics and Mechanics, Section on Mathematical Signal and Image Processing, Lecce, Italy, March 23–27, 2015
- "Sparsity-Based Approaches to Image Processing: Bridging Theory and Application," GAMM 85th Annual Meeting of the International Association of Applied Mathematics and Mechanics, Section on Mathematical Signal and Image Processing, Erlangen, Germany, March 10–14, 2014
- "Frame Theory for Locally Compact Abelian Groups," Wavelets & Sparsity XV, SPIE Optics & Photonics 2013, San Diego, CA, USA, August 25–29, 2013
- "Image Inpainting: Theoretical Analysis and Comparison of Algorithms," Wavelets & Sparsity XV, SPIE Optics & Photonics 2013, San Diego, CA, USA, August 25–29, 2013
- "Harmonic Analysis for Locally Compact Abelian Groups," International Workshop on p-Adic Methods for Modeling of Complex Systems, Zentrum für interdisziplinäre Forschung (Center for Interdisciplinary Research), Bielefeld, Germany, April 15–19, 2013

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- "Image Inpainting via Analysis-Side ℓ^1-Minimization," Young Researcher Mini-Symposium on Compressed Sensing and Applications, GAMM 84th Annual Meeting of the International Association of Applied Mathematics and Mechanics, Novi Sad, Serbia, March 18–22, 2013
- "Image Inpainting via Analysis-Side ℓ^1-Minimization," Sparse Representation of Functions: Analytic and Computational Aspects, MATHEON, TU Berlin, Berlin, Germany, December 10–14, 2012
- "Image Inpainting via Analysis-Side ℓ^1-Minimization," Advances in Mathematical Image Processing, Göttingen, Germany, September 4–6, 2012
- "Image Inpainting via Analysis-Side ℓ^1-Minimization," Workshop on Applied Harmonic Analysis and Sparse Approximation, Mathematisches Forschungsinstitut Oberwolfach, Germany, June 11–15, 2012
- "Image Inpainting via Analysis-Side ℓ^1-Minimization," International Conference on MultivariateApproximation, Hagen, Germany, September 24–27, 2011
- "Shearlets and Representation Theory (and the Wick calculus)," Workshop on Operator Algebra and Representation Theory: Frames, Wavelets and Fractals, Mathematisches Forschungsinstitut Oberwolfach, Germany, March 27–April 2, 2011
- "Generalized Shearlets and Representation Theory," February Fourier Talks, Norbert Wiener Center, College Park, MD, USA, February 17–18, 2011
- "Quincunx MRA for $L^2(\mathbb{Q}_2^2)$ and self-similar tilings," AMS Special Session on Wavelets, Tilings, and Iterated Function Systems, Joint Mathematics Meetings, New Orleans, LA, USA, January 6–9, 2011
- "High-Resolution Autofluorescence Imaging for Mapping Macular Processes Within the Human Retina" (poster), NICHD Sixth Annual Meeting of Postdoctoral, Clinical, & Visiting Fellows, Warrenton, VA, USA, May 3–4, 2010
- "Representation theory of generalized shearlets," Illinois/Missouri Applied Harmonic Analysis Seminar, Northern Illinois University, Dekalb, IL, USA, April 24, 2010
- "Grassmannian fusion frames," Workshop on Optimal Frames and Operator Algebras, San Francisco State University, San Francisco, CA, USA, January 17–19, 2010
- "Grassmannian fusion frames," Mini-conference in Harmonic Analysis on the Occasion of John Benedetto's 70th Birthday, University of Maryland, College Park, MD, USA, August 21, 2009
- "Grassmannian fusion frames," Graduation Conference, University of Maryland College Park, May 1, 2009

University of Bremen · ZeTeM, FB 03 · Postfach 330 440 · 28334 Bremen · Germany
✉ king@math.uni-bremen.de ☎ +49 (421) 218 - 59894

Emily J. King

- "The Geometry of Wavelets: Fractals and Group Representations," Graduation Conference, University of Maryland, College Park, MD, USA, April 13, 2007

Contributed and Self-Invited Conference and Workshop Presentations

- "Game of Sloanes: Best Known Packings in Complex Projective Space," Wavelets & Sparsity XVIII, SPIE Optics + Photonics, San Diego, CA, USA, August 11–15, 2019
- "Optimal subspace and spectrahedron arrangements in frame theory and quantum information theory," Minisymposium on Algebra, Geometry, and Combinatorics of Subspace Packings, SIAM Conference on Applied Algebra Geometry, Bern, Switzerland, July 9–13, 2019
- "Introduction to Low Complexity Models in Data Analysis and Machine Learning," Special Session on Low Complexity Models in Data Analysis and Machine Learning, Joint Mathematics Meetings, Baltimore, MD, USA, January 16–19, 2019
- "Difference Sets and Grassmannian Packings," AMS Contributed Paper Session on Combinatorics and Graph Theory, III, Joint Mathematics Meetings, Baltimore, MD, USA, January 16–19, 2019
- "Introduction to Algebraic, Geometric, and Combinatorial Methods in Frame Theory," Mini-Workshop on Algebraic, Geometric, and Combinatorial Methods in Frame Theory, Oberwolfach, Germany, October 1–5, 2019
- "Negative cliques in sets of equiangular lines," Tight Frames and Approximation, Taipa, New Zealand, February 20–23, 2018
- "Difference Sets and Grassmannian Packings," SIAM Conference on Applied Algebraic Geometry, Atlanta, GA, USA, July 31–August 4, 2017
- "Difference Sets and Grassmannian Packings," European Women in Mathematics – German Chapter Conference 2017, University of Bielefeld, Bielefeld, Germany, June 9–10, 2017
- "Shearlet-Based Morphological Component Analysis: Theory and Applications," Applied Inverse Problems 2017, Hangzhou, China, May 29–June 6, 2017
- "Shearlet-Based Morphological Component Analysis: Theory and Applications," GAMM 88th Annual Meeting of the International Association of Applied Mathematics and Mechanics, Section on Mathematical Signal and Image Processing, Weimar, Germany, March 6–10, 2017
- "Shearlets and Morphological Component Analysis," Mathematics of Signal Processing Hausdorff Trimester Program, Bonn, Germany, February 24, 2016

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✉ king@math.uni-bremen.de ☎ +49 (421) 218 - 59894

Emily J. King

- "Algebraic and Geometric Spread in Finite Frames" (poster), 2nd International Matheon Conference on Compressed Sensing and its Applications, TU Berlin, Berlin, Germany, December 7–11, 2015
- "Shearlet-Based Edge Detection: Flame Fronts and Tidal Flats," Applications of Digital Image Processing XXXVIII, SPIE Optics & Photonics 2015, San Diego, CA, USA, August 9–13, 2015
- "Sparse Representations and Compressed Sensing," Compressed Sensing Workshop, Bremen, Germany, March 17, 2015
- "Multiscale Geometric Analysis" (copresented with Martin Storath), GAMM 85th Annual Meeting of the International Association of Applied Mathematics and Mechanics, Young Researchers' Minisymposium on Multiscale Geometric Image Analysis, Erlangen, Germany, March 10–14, 2014
- "Quincunx wavelets for $L^2(\mathbb{Q}_2^2)$ and self-similar tilings," Operator Algebras, Frames, and Undergraduate Research: A Conference in Honor of the 70th Birthday of David R. Larson, Texas A&M University, College Station, TX, USA, July 20–22, 2012
- "Generalized shearlets and the extended metaplectic group," Baton Rouge Workshop in Analysis and Geometry, Louisiana State University, Baton Rouge, LA, USA, January 4–5, 2011
- "Age-related molecular degeneration & retinal image processing and RNA pseudoknots" (poster), Program in Physical Biology Retreat, National Institutes of Health, Bethesda, MD, USA, November 17, 2010
- "Generalized shearlets and the extended metaplectic group," Joint Mathematics Meetings, San Francisco, CA, USA, January 13–16, 2010
- "Smooth functions associated with wavelet sets on $\mathbb{R}^d$, $d \geq 1$, and frame bound gaps," The International Conference: Wavelets and Applications, Euler International Mathematical Institute St. Petersburg, Russia, June 15–19, 2009
- "Smooth functions associated with wavelet sets on $\mathbb{R}^d$ and frame bound gaps," D.C. Math Graduate Student Meeting, George Washington University, Washington DC, USA, April 25–26, 2009
- "Smooth functions associated with wavelet sets on $\mathbb{R}^d$ and frame bound gaps" (poster), February Fourier Talks, Norbert Wiener Center, College Park, MD, USA, February 19–20, 2009
- "Smooth functions associated with wavelet sets on $\mathbb{R}^d$, $d \geq 1$, and frame bound gaps," AMS Special Session on Harmonic Analysis, Joint Mathematics Meetings, Washington DC, USA, January 3–8, 2009
- "Frame Theory" (an expository talk), Progress in Mathematics for Communication Systems Summer Academy at the International Center for Transdisciplinary Studies School of Engineering and Science, Jacobs University, Bremen, Germany, July 2–13, 2007

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Emily J. King

- "The Geometry of Wavelets: Shearlets, Fractals and Group Representations," Spotlight on Graduate Research, University of Maryland, College Park, MD, November 8, 2006
- "Some Constructions of Finite Tight Frames," Spotlight on Graduate Research, University of Maryland, College Park, MD, USA, Fall 2005
- "Tight Frames and Sampling Theory" (poster with Nathaniel Strawn), Undergraduate Student Poster Session, Joint Mathematics Meetings, Phoenix, AZ, USA, January 7–10, 2004
- "A Matricial Algorithm for Polynomial Refinement," MathFest, Boulder, CO, USA, July 31–August 2, 2003
- "Refinability of Multivariate Polynomials" (copresented with Justin Turner and Philip Watkins), TAMU REU/VIGRE Student Miniconference, Texas A&M University, College Station, TX, USA, July 22, 2003
- "A Matricial Algorithm for Polynomial Refinement," Nebraska Conference for Undergraduate Women in Mathematics, University of Nebraska, Lincoln, NE, USA, February 1–3, 2002
- "A Matricial Algorithm for Polynomial Refinement" (poster), Sigma Xi Student Research Conference, Galveston, TX, USA, November 15–17, 2002
- "A Matrix System for Polynomial Refinement," REU Conference, Texas A&M University, College Station, TX, USA, July 2002
- "Methodologies and Emergent Patterns in Forming Elliptical Tight Frame Sequences," REU Conference, Texas A&M University, College Station, TX, USA, July 2002

Colloquium Talks

- "(Hilbert Space) Frames, Algebraic Combinatorics, and Geometry," DMS Colloquium, Auburn University, Auburn, AL, USA, March 30, 2018
- "Shearlet Theory and Applications," Lothar Collatz Kolloquium für Angewandte Mathematik, University of Hamburg, Hamburg, Germany, February 1, 2018
- "Optimal Representation Systems and Sparsity," AWI Kolloquium, Alfred Wegener Institute for Polar and Marine Research, Bremerhaven, Germany, January 17, 2018
- "(Hilbert Space) Frames, Algebraic Combinatorics, and Geometry," Mathematisches und Mathematikdidaktisches Kolloquium, Carl von Ossietzky University of Oldenburg, Oldenburg, Germany, October 25, 2017

University of Bremen · ZeTeM, FB 03 · Postfach 330 440 · 28334 Bremen · Germany
✉ king@math.uni-bremen.de ☎ +49 (421) 218 - 59894

Emily J. King

- "Frames and Geometry," Institut für Mathematik Kolloquium, University of Osnabrück, Osnabrück, Germany, July 1, 2015
- "Shearlets: From Algebra to Applications," Mathematisches Kolloquium, University of Bremen, Germany, November 11, 2014
- "Frames Meet Algebraic Geometry," Kolloquium über Angewandte Mathematik, University of Göttingen, Germany, July 22, 2014
- "Protein-Protein Docking and the Fast Fourier Transform," Department of Mathematics Undergraduate Colloquium, University of Houston, Houston, TX, USA, March 26, 2013

Seminar Talks

- "Glühwein* and Block Designs. *Glühwein not included," FB3 Weihnachtsfeier, University of Bremen, Bremen, Germany, December 19, 2018
- "Combinatorics and Discrete Geometry in (Hilbert Space) Frames," Kombinatorische Strukturen in der Geometrie Kollegseminar, University of Osnabrück, Osnabrück, Germany, November 12, 2018
- "Edge, Ridge, and Blob Detection with Symmetric Molecules," Image Analysis Seminar, University of Houston, TX, USA, August 27, 2018
- "Frames and Bases over Locally Compact Abelian Groups," Analysis Seminar, University of Houston, Houston, TX, USA, October 6, 2017
- "Difference Sets and Grassmannian Packings," Seminario de Análisis Real, Armónico y Geometría Fractal, Universidad de Buenos Aires, Buenos Aires, Argentina, August 27, 2017
- "Difference Sets and Grassmannian Packings," Harmonic Analysis Theory & Applications Seminar, Danmarks Tekniske Universitet, Kongens Lyngby, Denmark, September 19, 2016.
- "Optimal Representation Systems and Sparsity," Department of Mathematics and Statistics Seminar, AFIT, OH, USA, May 25, 2016
- "Optimal Representation Systems and Sparsity," Fachgebiet Technische Thermodynamik Seminar, University of Bremen, Germany, December 5, 2015
- "Wavelets: Ergodic Sets and Fractal Tilings," Dynamical Systems and Geometry Oberseminar, University of Bremen, Germany, November 27, 2014

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Emily J. King

- "Optimal Representation Systems and Sparsity," Seminar on Physics and Chemistry of the Atmosphere, University of Bremen, Germany, July 11, 2014
- "Frames Meet Algebraic Geometry," AFG Oberseminar, TU Berlin, Berlin, Germany, March 27, 2014
- "(Hilbert Space) Frames Meet Algebraic Geometry," ALTA Oberseminar, University of Bremen, Bremen, Germany, February 5, 2014
- "Harmonic Analysis on Locally Compact Abelian Groups," AFG Oberseminar, TU Berlin, Berlin, Germany, June 20, 2013
- "Harmonic Analysis on Locally Compact Abelian Groups: What is known and new frontiers," Danmarks Tekniske Universitet, Kongens Lyngby, Denmark, May 14, 2013
- "Shearlet-Based Inpainting," Analysis Seminar, University of Houston, Houston, TX, USA, March 25, 2013
- "Image Inpainting via Analysis-Side ℓ^1-Minimization," Oberseminar Angewandte Funktionalanalysis, TU Berlin, Berlin, Germany, February 28, 2013
- "Isotropic shearlet analogs for $L^2(\mathbb{R}^k)$ and localization operators," Seminario de Análisis y Aplicaciones, Universidad Autónoma de Madrid, Madrid, Spain, January 18, 2013
- "Image Inpainting via Analysis-Side ℓ^1-Minimization," Institute of Biomathematics and Biometry Colloquium, Helmholtz Zentrum München, Munich, Germany, May 4, 2012
- "Generalized Shearlets, Representation Theory, and the Wick Calculus," Applied Harmonic Analysis Group Seminar, University of Bonn, Germany, October 20, 2011
- "Grassmannian Fusion Frames," Jacobs Computational Analysis Seminar, Jacobs University, Bremen, Germany, April 6, 2011
- "Protein-Protein Docking and the FFT," NWC Seminar, Norbert Wiener Center, College Park, MD, USA, November 2, 2010
- "Biological Network Theory – How Actors are Like Neurons in *C. elegans*," AMSC Student Seminar, University of Maryland, College Park, MD, USA, October 19, 2010
- "Biological Network Theory – How Actors are Like Neurons in *C. elegans*, I & II," NICHD Postbac Course: Becoming an Effective Scientist, National Institutes of Health, Bethesda, MD, USA, October 4 & 18, 2010

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✉ king@math.uni-bremen.de ☎ +49 (421) 218 - 59894

Emily J. King

- "Protein-Protein Docking," Building 9 Computational Bio Journal Club, National Institutes of Health, Bethesda, MD, USA, July 29, 2010
- "Biological Pattern Formation," Building 9 Computational Bio Journal Club, National Institutes of Health, Bethesda, MD, USA, January 7, 2010
- "Harmonic Analysis on Locally Compact Abelian Groups," Student Analysis and PDE Seminar, University of Maryland, College Park, MD, USA, April 14, 2009
- "p-Adic Wavelets and Pseudodifferential Operators," Student Analysis and PDE Seminar, University of Maryland, College Park, MD, USA, March 31, 2009
- "Hadamard Matrices: Theory and Applications," Women in Mathematics Lunch, University of Maryland, College Park, MD, USA, March 25, 2009
- "The Extended Metaplectic Group," Student Analysis and PDE Seminar, University of Maryland, College Park, MD, USA, February 10, 2009
- "Smooth functions associated with wavelet sets on $\mathbb{R}^d$, $d \geq 1$, and frame bound gaps," NWC Seminar, Norbert Wiener Center, College Park, MD, USA, December 9, 2008
- "Hadamard Matrices: Theory & Applications," Graduate MiniCourse, University of Maryland, College Park, MD, USA, March 31, 2008
- "The Geometry of Wavelets: Fractal Tilings, Representations and Shearlets," Graduate MiniCourse, University of Maryland, College Park, MD, USA, March 24, 2008
- "Intro to Harmonic Analysis: Finite Frame Theory," NWC Seminar, Norbert Wiener Center, College Park, MD, USA, September 27, 2007
- "Density of Gabor Frames," NWC Seminar, Norbert Wiener Center, College Park, MD, USA, February 8, 2007

Short Courses and Special Lectures

- "Low Complexity Modeling in Data Analysis and Image Processing," 90-minute lecture, 3rd Annual Neuroengineering Retreat of the Elite MSc in Neuroengineering of the Technical University of Munich, Brixlegg, Austria, May 30–June 2, 2019
- "Data Analysis and Image Processing: Low Complexity Modeling," short course with 7.5 hours of lecture and 7.5 hours of problem sessions, Research Training Group, π^3 Parameter Identification, Bremen, Germany, January 23–27, 2017

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- "Mathematical Transforms and Sparsity: Harmonic Analysis and its Applications," 4 hour short course team taught with Rafael Reisenhofer, Interdisciplinary College, Günne at Lake Möhne, Germany, March 3–5, 2016

Talks for the Open Public

- "Millennium-Probleme," Open Campus, University of Bremen, Bremen, Germany, June 15, 2019
- "Millennium-Probleme," Open Campus, University of Bremen, Bremen, Germany, June 11, 2015

Other Conferences and Workshops Attended

- 38th Northern German Colloquium on Applied Analysis and Numerical Mathematics, Hamburg University of Technology, Hamburg, Germany, May 4–5, 2017
- Summer Informal Regional Functional Analysis Seminar (SUMIRFAS), Texas A&M University, College Station, TX, USA, July 29–31, 2016
- Concentration Week on Geometric Functional Analysis, Texas A&M University, College Station, TX, USA, July 25–29, 2016
- Workshop on Harmonic Analysis, Graphs and Learning, Hausdorff Research Institute for Mathematics, Bonn, Germany, March 14–18, 2016
- Workshop on Finite Weyl-Heisenberg Groups in mathematics, quantum physics, and engineering, Hausdorff Research Institute for Mathematics, Bonn, Germany, February 22–24, 2016
- Workshop on Low Complexity Models in Signal Processing, Hausdorff Research Institute for Mathematics, Bonn, Germany, February 15–19, 2016
- Winter School on Advances in Mathematics of Signal Processing, Hausdorff Research Institute for Mathematics, Bonn, Germany, January 11–15, 2016
- February Fourier Talks, Norbert Wiener Center, College Park, MD, USA, February 19–20, 2015
- IUP – AWI Blockseminar : Human Impact on the Earth System, University of Bremen, Bremen, Germany, February 6, 2015
- IUP – AWI Blockseminar : Ice – Ocean Interaction, Alfred Wegener Institut, Bremerhaven, Germany, July 29, 2014
- IUP – AWI Blockseminar: Climate Change, University of Bremen, Bremen, Germany, February 3, 2014

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- Matheon Workshop on Compressed Sensing and its Applications, TU Berlin, Berlin, Germany, December 9–13, 2013
- (Invited Workshop Participant), Frame Theory Intersects Geometry, American Institute of Mathematics, Palo Alto, CA, USA, July 29–August 2, 2013
- Computational Analysis in Systems Biology, National Institutes of Health, Bethesda, MD, USA, September 23, 2010
- Mini-Symposium: Random Walks in Biology and Beyond In Honor of Dr. George H. Weiss, National Institutes of Health, Bethesda, MD, USA, May 26, 2010
- From Banach Spaces to Frame Theory and Applications: In Honor of Professor Pete Casazza's 65th Birthday, University of Maryland, College Park, MD, USA, May 20–22, 2010
- Southern Biomedical Engineering Conference, University of Maryland, College Park, MD, USA, April 30–May 2, 2010
- International Conference on Social Computing, Behavioral Modeling, and Prediction Pre-Conference Tutorials, National Institutes of Health, Bethesda, MD, USA, March 29, 2010
- February Fourier Talks, Norbert Wiener Center, College Park, MD, USA, February 18–19, 2010
- IPAM Workshop on Mathematical Problems, Models and Methods in Biomedical Imaging, Institute for Pure and Applied Mathematics, Los Angeles, CA, USA, February 8–12, 2010
- Systems Biology Collaboration Workshop, University of Maryland, College Park, MD, USA, January 26, 2010
- The Inter-Institute Workshop on Optical Diagnostic and Biophotonic Methods from Bench to Bedside, National Institutes of Health, Bethesda, MD, USA, October 1–2, 2009
- Summer Time Frequency Talks: Workshop on Biomedical Image Analysis and Algorithms, National Institutes of Health, Bethesda, MD, USA, August 20, 2009
- AMS Short Course on Quantum Computation and Quantum Information, Joint Mathematics Meetings, Washington DC, USA, January 3–8, 2009
- Workshop on Random Matrix Theory and Wireless Communications, University of Colorado, Boulder, CO, USA, July 14–17, 2008
- Summer Time Frequency Talks, Norbert Wiener Center, College Park, MD, USA, June 26, 2008

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- February Fourier Talks, Norbert Wiener Center, College Park, MD, USA, February 21–22, 2008
- Nebraska Conference for Undergraduate Women in Mathematics, University of Nebraska, Lincoln, NE, USA, February 8–10, 2008
- Joint Mathematics Meetings, San Diego, CA, USA, January 6–9, 2008
- IPAM Short Course Sparse Representations and High Dimensional Geometry, Institute for Pure and Applied Mathematics, Los Angeles, CA, USA, May 30–June 1, 2007
- February Fourier Talks, Norbert Wiener Center, College Park, MD, USA, February 15–16, 2007
- Joint Mathematics Meetings, New Orleans, LA, USA, January 5–8, 2007
- February Fourier Talks, Norbert Wiener Center, College Park, MD, USA, February 16–17, 2006
- Joint Mathematics Meetings, San Antonio, TX, USA, January 12–15, 2006
- Combinatexas, Texas State University, San Marcos, TX, USA, February 25–26, 2005
- Joint Mathematics Meetings, Atlanta, GA, USA, January 5 – 8, 2005
- Joint Mathematics Meetings, Baltimore, MD, USA, January 15 – 18, 2003
- Society of Women Engineers Regional Conference, Texas Tech University, Lubbock, TX, USA, October 13 – 14, 2000

Research Visits

- Prof. Bernhard Bodmann, University of Houston, Houston, TX, USA, April 8–12, 2019
- Prof. Bernhard Bodmann, University of Houston, Houston, TX, USA, August 13–31, 2018
- Prof. Nate Strawn, Georgetown University, Washington DC, USA, July 21–August 3, 2018
- Prof. Luke Oeding, Auburn University, Auburn, AL, USA, March 28–30, 2018
- Prof. Bernhard Bodmann, University of Houston, Houston, TX, USA, September 27– October 13, 2017
- Prof. Victoria Paternostro, Universidad de Buenos Aires, Buenos Aires, Argentina, August 14–September 1, 2017
- Summer of Frame Theory 2, Air Force Institute of Technology, Dayton, OH, USA, July 25–28, 2017

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- Prof. Jakob Lemvig, Danmarks Tekniske Universitet, Kongens Lyngby, Denmark, September 19–23, 2016
- Prof. Bernhard Bodmann / Prof. Demetrio Labate / Prof. Manos Papadakis, University of Houston, Houston, TX, USA, July 5–22, 2016
- Norbert Wiener Center, University of Maryland / Prof. Nate Strawn, Georgetown University / Prof. Chris Manon, George Mason University, College Park, MD / Washington DC / Fairfax, VA, June 3–14, 2016
- Summer of Frame Theory, Air Force Institute of Technology, Dayton, OH, USA, May 4–June 1, 2016
- Mathematics of Signal Processing, Hausdorff Trimester Program, Bonn, Germany, January 4–March 24, 2016
- FG Angewandte Funktionalanalysis, TU Berlin, Berlin, Germany, March 26–28, 2014
- Prof. Jakob Lemvig, Danmarks Tekniske Universitet, Kongens Lyngby, Denmark, May 13–20, 2013
- Prof. Eugenio Hernández, Universidad Autónoma de Madrid, Madrid, Spain, January 15–18, 2013
- Dr. Martin Ehler, Helmholtz Zentrum München, Munich, Germany, May 4–8, 2012
- Prof. Maria Skopina, Euler Institute, St. Petersburg, Russia, June 1–30, 2009

Research Visitors

- Prof. Cynthia Vinzant, North Carolina State University, NC, USA, June 30–July 3, 2019
- Prof. Dustin Mixon, Ohio State University, OH, USA, June 10–12, 2018
- Dr. Erik Bekkers, Technische Universiteit Eindhoven, Netherlands, January 10–12, 2018
- Prof. Jakob Lemvig, Danmarks Tekniske Universitet, Kongens Lyngby, Denmark, December 14–15, 2015
- Prof. Jakob Lemvig, Danmarks Tekniske Universitet, Kongens Lyngby, Denmark, June 19–21, 2013
- Dr. Jameson Cahill, University of Missouri, USA, June 3–7, 2013
- Dr. Nathaniel Strawn, Duke University, USA, June 3–7, 2013

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Emily J. King

Teaching & Pedagogy

Teaching & Grading

- Instructor of Record, Linear Algebra I MATH 369, Colorado State University, Fall 2019
- Instructor of Record, Algebraic, Geometric and Combinatorial Methods in Frame Theory [upper-level lecture with problem sessions], University of Bremen, Summer 2019
- Instructor of Record, Harmonic Analysis: Theory and Applications [upper-level lecture with problem sessions], University of Bremen, Winter 2018–2019
- Co-Instructor, Inverse Methods and Data Analysis [master's course in environmental physics and space science] (Matlab assignments), University of Bremen, Winter 2018–2019
- Discussion Leader, Randomization in data analysis [reading course for doctoral students], University of Bremen, Winter 2017–2018
- Discussion Leader, Sparse and redundant representation systems [reading course for doctoral students], University of Bremen, Winter 2017–2018
- Co-Instructor, Inverse Methods and Data Analysis [master's course in environmental physics and space science] (Matlab assignments), University of Bremen, Winter 2017–2018
- Instructor of Record, Analysis 2, [large lecture course with additional "Plenum" section], University of Bremen, Summer 2017
- Co-Instructor, Inverse Methods and Data Analysis [master's course in environmental physics], University of Bremen, Winter 2016–2017
- Co-Instructor, Introduction to Mathematical Parameter Identification [one week block course as part of a 6 week program], Winter 2016–2017
- Instructor of Record, Analysis 1, [large lecture course with "Plenum" section], University of Bremen, Winter 2016–2017
- Co-Instructor, Inverse Methods and Data Analysis [master's course in environmental physics] (Matlab assignments), University of Bremen, Winter 2015–2016
- Instructor of Record, Compressed Sensing, [graduate-level lecture with problem sessions], University of Bremen, Summer 2015

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- Co-Instructor, Inverse Methods and Data Analysis [master's course in environmental physics] (Matlab assignments), University of Bremen, Winter 2014–2015
- Co-Instructor, Frames: Eine Einführung [combined proseminar and seminar], University of Bremen, Winter 2014–2015
- Instructor of Record, Dictionaries and Transforms [upper-level harmonic analysis lecture with problem sessions], University of Bremen, Summer 2014
- Grader, Precalculus MATH 115 and Elementary Calculus I MATH 220, University of Maryland, Summer 2009
- Recitation Leader, Intro to Linear Algebra MATH 240 (Matlab assignments), University of Maryland, Spring 2009
- Mentor and T.A., Graduate Student Boot Camp – Linear Algebra, University of Maryland, Summer 2008
- Recitation Leader, Applied Statistics & Probability STAT 400, University of Maryland, Spring 2008
- Recitation Leader, Elementary Calculus II MATH 221 [calculus for business and life science majors] (Web Assign assignments), University of Maryland, Fall 2007
- Grader, Cryptography MATH 470 (online course, Matlab assignments), Texas A&M University, Summer 2005
- Recitation Leader, Engineering Mathematics I MATH 151 [calculus for engineers] (Maple assignments),Texas A&M University, Spring 2005
- Recitation Leader, Functions MATH 150 [precalculus] (iLrn quizzes and exams), Texas A&M University, Fall 2004
- Grader, Foundations of Mathematics MATH 220 [logic, set theory, and discrete math for math majors], Texas A&M University, Fall 2003
- Private Mathematics Tutor [high school algebra II, college algebra, calculus I/II, business math, business calculus, applied calculus, statistics and linear algebra], Spring 2003–Summer 2004

Training

- Professionelle, gender- und diversitätsgerechte Personalauswahl in der Wissenschaft (Professional, gender- and diversity-appropriate personnel selection in science), University of Bremen, Bremen, Germany, March 2019

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Emily J. King

- Zertifikatsprogramm Hochschule Didaktische Qualifizierung (Certificate Program in University-Level Didactics), 200 classroom hours, University of Bremen, Bremen, Germany, February 2017–April 2019
- Rhetorik – Professionell und motivierend vortragen, Universiät of Bremen Personalentwicklung (University of Bremen Personnel Development), Bremen, Germany, March 23, 2017
- National Institute of Child Health and Human Development Teaching Workshop, National Institutes of Health, Bethesda, MD, USA, March 2010
- TA Teaching Seminar MATH 695 (required), University of Maryland, College Park, MD, USA, Fall 2007
- Graduate Teaching Academy, Center for Teaching Excellence, Texas A&M, College Station, TX, USA, Fall 2004–Spring 2005

Advising & Mentoring

Doctoral Students

- Advisor, Sören Schulze, Dr. rer. nat. student, "Separation of Musical Instruments" (working title) University of Bremen, December 2016 – Now
- Advisor, Rafael Reisenhofer, Dr. rer. nat, "Image Analysis via Applied Harmonic Analysis: Perceptual Image Quality Assessment, Visual Servoing, and Feature Detection", University of Bremen, November 2014 – September 2018
- Co-Advisor, Frederieke Miesner, Dr. rer. nat., "Advanced Inverse Modeling of Sediment Thermal Diffusion Processes: Reconstructing Temporal Variant Boundary Conditions for the One-Dimensional Heat Equation", University of Bremen, June 2017 – July 2018

Master's Students

- Advisor, Lennart Abels, M.S., "Randomized Image Inpainting" (working title) University of Bremen, February 2019 –now
- Advisor, Sören Dittmer, M.S., "Mathematical Analysis of Information Loss and Errors in Neural Networks", University of Bremen, February – September 2017
- Advisor, Sören Schulze, M.S., "Spectogram-based Musical Instrument Separation via Pitch-invariant Dictionaries," University of Bremen, January – October 2016
- Advisor, Alina Stürck, M.S., "Shearlet-Based Image Inpainting," University of Bremen, August 2014 – March 2015

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Bachelor's Students

- Advisor, Julian Gebken, B.S., "Gaussian Mean Width in Generative Neural Networks" (working title), University of Bremen, December 2018 –now
- Advisor, Laura Breitkopf, B.S., "Tangent and Curvature Estimation of $2D$ Point Clouds," University of Bremen, January – September 2018

Other Doctoral & Master's Committees

- Committee Member (Prüfungsausschuss [non-grading committee member]), Florian Bürgel, Dr. rer. nat. student, "Effective and Efficient Reconstruction Schemes for the Inverse Medium Problem in Scattering," University of Bremen, August 2019
- Committee Member (Prüfungsausschuss [non-grading committee member]), Daniel Lantzberg, Dr. rer. nat. student, "Quantum Frames and Uncertainty Principles Arising from Symplectomorphisms," University of Bremen, February 2019
- Committee Member (2. Gutachter [grader]), Tobias Schnier, Dr.-Ing. student, "Acquisition and Reconstruction of Compressed Signals with Applications in Wireless Neural Systems," University of Bremen, November 2017 – February 2019
- Committee Member (Prüfungsausschuss [non-grading committee member]), Thuong Huyen Nguyen, Dr. rer. nat. student, "Mathematical aspects of catalyst positioning in Lithium/air batteries," University of Bremen, December 2018
- Committee Member (2. Gutachter [grader]), Lukas Zumvorde, M.S. student, "Distributed Kalman Filtering for Large-Scale Dynamic Systems with Sparcely [sic] Coupled States," University of Bremen, March 2018 – September 2018
- Committee Member (Prüfungsausschuss [non-grading committee member]), Florian Lieb, Dr.-Ing. student, "The Affine Uncertainty Principle, Associated Frames and Applications in Signal Processing," University of Bremen, July 2018
- Committee Member (2. Gutachter [grader]), Marcel Rennoch, Dr. rer. nat. student, "Regularization Methods in Banach Spaces Applied to Inverse Medium Scattering Problem," University of Bremen, March – June 2017
- Committee Member (Prüfungsausschuss [non-grading committee member]), Anna Kemper, Dr.-Ing. student, "Modellbasierte optimale Mehrgrößenregelung und optimale Reglerparametrisierung für Luftsysteme von Pkw-Dieselmotoren," University of Bremen, July 2015

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- Committee Member (2. Gutachter [grader]), Joshua Belding, M.S. student, "From One-Dimensional Signals to Hyperspectral Images: Robustness and Numerical Experiments in Compressed Sensing," University of Bremen, August 2014 – January 2015
- Committee Member (External referee), Lucia Mantovani, Ph.D. student, "Admissible Vectors and Discretization for 2-dimensional Signals," Università degli Studi di Genova, Genoa, Italy, January 2013

Other Advising Roles

- Advisor, Scott Mahan, visiting graduate student from University of California San Diego, "Approximation of Sobelev Functions in Neural Networks," University of Bremen, June – July, 2019
- Reading Course Advisor, Janek Gödeke, M.S. student, (work in progress), University of Bremen, Germany, April 2019 –
- Reading Course Advisor, Barbara Stolerek, M.S. student, "Dictionary-Learning und K-SVD Algorithmus," University of Bremen, Germany, April – December 2018
- Reading Course Advisor, Sören Dittmer, "Frame Theory and Feature Extraction" and "Representation Theory of Lie Groups," University of Bremen, Germany, March 2016 – February 2017
- Advisor, Tianlin Liu, undergraduate intern from Jacobs University, "Compressed Sensing and Structured Dictionary Learning," University of Bremen, Germany, June – September 2015
- Advisor, David Rea, visiting graduate student from Clemson University, "Structured Dictionary Learning," University of Bremen, Summer 2014
- Mentor, Sandra Kneiper, M.S. student, "Analysis of Generalized Ridge Functions in High Dimensions," TU Berlin, Summer 2012

Mentoring

- Seminar Speaker, Women in Math Seminar, University of Houston, TX, USA, August 29, 2018
- Mentor, Postgraduate Programme Environmental Physics, University of Bremen, Germany, January 2018 – July 2019
- Mentor, Tea-Time mit Professorinnen, navigare - Career Coaching for International Females in Science, University of Bremen, Bremen, Germany, April 26, 2018
- Graduate Student Mentor, Nebraska Conference for Undergraduate Women in Mathematics, University of Nebraska, Lincoln, NE, USA, February 2008

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- Graduate Student Mentor, REU in Matrix Analysis and Wavelet Theory, Texas A&M University, College Station, TX, USA, Summer 2005

Other Service Activities

Conference and Special Session Planning

- Co-organizer, Special Session on Group Actions in Harmonic Analysis, Joint Mathematics Meetings, Denver, CO, USA, January 15–18, 2020
- Co-organizer, Workshop for John Benedetto's 80th Birthday, University of Maryland, College Park, MD, USA, September 19–21, 2019
- Co-organizer, Special Sessions on Optimal Frames and Subspace Packings and Applications of Frames and Related Transforms, Wavelets & Sparsity XVIII, SPIE Optics & Photonics, San Diego, California, USA, August 11–15, 2019
- Co-Organizer, Minisymposium on Algebra, Geometry, and Combinatorics of Subspace Packings, SIAM Conference on Applied Algebraic Geometry, Bern, Switzerland, July 9–13, 2019
- Co-Chair, Out of Your Senses – From Data to Insight, Interdisciplinary College IK 2019, Möhnesee-Günne, Germany, March 12–19, 2019
- Co-Organizer, Special Session on Low Complexity Models in Data Analysis and Machine Learning, Joint Mathematics Meetings, Baltimore, MD, USA, January 16–19, 2019
- Co-Organizer, Oberwolfach Mini-workshop 1840c: Algebraic, Geometric, and Combinatorial Methods in Frame Theory, Oberwolfach, Germany, September 20–October 6, 2018
- Organizing Committee Chair, Mathematical Signal Processing and Data Analysis, Annual Workshop of the GAMM Working Group in Mathematical Signal and Image Processing, University of Bremen, Germany, September 18–20, 2017.
- Co-Organizer, Minisymposium on Algebra and Geometry in Frame Theory, SIAM Conference on Applied Algebraic Geometry, Atlanta, Georgia, USA, July 31–August 4, 2017
- Co-Organizer, Minisymposium on Inverse Problems and Low Complexity Models, Applied Inverse Problems 2017, Hangzhou, China, May 29–June 2, 2017
- Co-Organizer, Workshop on Frames and Algebraic & Combinatorial Geometry, University of Bremen, July 27–31, 2015

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- Co-Organizer, Minisymposium on Inverse Problems in Atmospheric Remote Sensing, Applied Inverse Problems 2015, Helsinki, Finland, May 25–29, 2015
- Co-Organizer, Bremen Compressed Sensing Workshop, University of Bremen, March 17, 2015
- Co-Organizer, Young Researcher Minisymposium on Multiscale Geometric Image Analysis, 85th Annual Meeting of the GAMM, Nuremberg-Erlangen, Germany, March 10–14, 2014
- Organizing Committee Chair, Frame Theory and Maps Between Operator Algebras, Texas A&M University, College Station, TX, USA, July 16–19, 2012
- Organizing Committee Chair, A Birthday Conference in Honor of David Larson, Texas A&M University, College Station, TX, USA, July 20–22, 2012
- Co-Organizer, Graduation Conference, Mathematics Department, University of Maryland, College Park, MD, USA, May 2, 2008

Seminars Organized

- Organizing Committee, What is ...? Seminar, Berlin Mathematical School, Berlin, Germany, October 2012–June 2013
- Organizer, FG Angewandte Funktionalanalysis Oberseminar, TU Berlin, Berlin, Germany, March 2012–June 2013
- Founder and Organizer, Institut für Numerishe Simulation Journal Club, University of Bonn, Bonn, Germany, October 2011–February 2012
- Organizer, Building 9 Computational Bio Journal Club, National Institutes of Health, Bethesda, MD, USA, 2010–2011
- Organizer, Women Who Use Applied Statistics & Stochastic Processes: A celebration of women across the campus who use applied statistics and stochastic processes in their research, University of Maryland, College Park, MD, USA, April 15, 2009
- Organizer, Women in Mathematics Lunch Seminar, University of Maryland, College Park, MD, USA, 2008–2009
- Co-Organizer, Norbert Wiener Center Seminar, University of Maryland, College Park, MD, USA, 2007–2008

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Elected Positions

- President, Women in Mathematics (a student chapter of the Association for Women in Mathematics), University of Maryland, 2008–2009
- Mathematics Graduate Student Representative, University of Maryland, 2007–2009
- Chair, Association for Women in Mathematics, Texas A&M University, 2004–2005
- Treasurer, Math Club, Texas A&M University, Fall 2003
- President, Math Club, Texas A&M University, 2002–2003

Committee Work

University of Bremen February–August 2019

Berufungskommission W2-Professur Mathematische Modellierung

Hiring committee (for $\sim$ associate professor position) member.

University of Bremen March 2018–July 2019

Netzwerk „Chancengleichheit in Forschungsverbünden"

A network to bring together researchers involved with gender and diversity in funded research programs

University of Bremen January 2018–July 2019

Mitgliederin im Prüfungsausschuss für den 2-Fächer-Bachelor

Actively participated as a substitute and then official member in the exam committee for the math education bachelor's degree.

University of Bremen December 2017–July 2019

Beauftragte für Einstufungsprüfung Mathematik

Official representative of the Mathematics Department in the committee to decide if certain students may study at the university without the typical qualifications.

University of Bremen May 2017–July 2019

Wissenschaftskommunikationsgruppe / Webseite Task Force

Member of the committees working to increase visibility of the Mathematics and Computer Science Department and specifically to overhaul the departmental website.

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University of Bremen October 2016–July 2019

Co-PI in charge of Gender and Diversity

PI in charge of Guests

Coorganized training and support in gender and diversity and organized guest visits for the Research Training Group π^3: Parameter Identification – Analysis, Algorithms, Application

University of Bremen June 2016–February 2017

Berufungskommission W3-Professur Technische Mathematik der Erdsystemwissenschaften

Hiring committee (for $\sim$ full professor position) member.

University of Bremen Winter 2015–2016

ZUK II / AG Internationalisierung

Met to discuss issues related to the future direction of and internationalization of the university.

TU Berlin March 2012–June 2013

Gruppenaktivitäten Koordinator, FG Angewandte Funktionalanalysis

Organized research group activities.

Association for Women in Mathematics 2009–2011

AWM Student Chapters Committee

Member of the national committee to improve the AWM student chapters program.

National Institute of Child Health and Human Development 2010–2011

NICHD Fellows Committee

Founding member of the committee to improve the status of fellows in NICHD and also improve communication among fellows.

MAA *Math Horizons* 2003–2005

Student Advisory Committee

Provided many ideas integrated into the *Math Horizons* magazine and wrote articles printed in the publication.

Journal & Conference Talk Refereeing

- Applicable Analysis
- Applied and Computational Harmonic Analysis
- Applied Numerical Mathematics
- Complex Analysis and Operator Theory

University of Bremen · ZeTeM, FB 03 · Postfach 330 440 · 28334 Bremen · Germany

✉ king@math.uni-bremen.de ☎ +49 (421) 218 - 59894

Emily J. King

- Houston Journal of Mathematics
- IEEE Signal Processing Letters
- IEEE Transactions on Signal Processing
- International Journal of Remote Sensing
- International Journal of Wavelets Multiresolution and Information Processing
- Journal of Fourier Analysis and Applications
- Journal of Geometric Analysis
- Journal of Imaging
- Journal of Physics A
- Journal of Scientific Computing
- Numerical Functional Analysis and Optimization
- Remote Sensing Letters
- Science Asia
- SIAM Journal on Applied Algebra and Geometry
- Studia Mathematica
- Mathematical Reviews (MathSciNet)
- Zentralblatt
- Proceedings of the Matheon Workshop on Compressed Sensing and its Applications 2013
- Talk referee and metareveiwer, SampTA 2019, 13th International Conference on Sampling Theory and Applications, Bordeaux, France, July 8–9, 2019
- Talk referee, SampTA 2017, 12th International Conference on Sampling Theory and Applications, Talinn, Estonia, July 3–7, 2017
- Talk referee, SampTA 2015, 11th International Conference on Sampling Theory and Applications, Washington DC, USA, May 25–26, 2015

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Emily J. King

- Program Committee (talk referee), Signal Processing with Adaptive Sparse Structured Representations, EPFL, Lausanne, Switzerland, July 8–11, 2013
- Talk referee, SampTA 2013, 10th International Conference on Sampling Theory and Applications, Bremen, Germany, July 1–5, 2013

Skills

Programming & Markup Languages

- Matlab
- LaTeX
- Python
- HTML/CSS
- Perl

Math Websites Designed

- Game of Sloanes, https://www.math.colostate.edu/ king/GameofSloanes.html, Summer 2019
- Mathematical Signal Processing and Data Analysis, Annual Workshop of the GAMM Working Group in Mathematical Signal and Image Processing, http://www.math.uni-bremen.de/cda/GAMM-MSIP2017/, Fall 2017, Note: Updated by Yovany Cordero
- Gesellschaft für Angewandte Mathematik und Mechanik Activity Group Mathematical Signal and Image Processing, http://www3.math.tu-berlin.de/numerik/GAMM-MSIP/, May 2012, Note: Revamped since then, but the core design remains.
- Concentration Week in Frame Theory and Maps Between Operator Algebras & Operator Algebras, Frames, and Undergraduate Research: A Conference in Honor of the 70th Birthday of David R. Larson, (no longer online), 2012
- Programs for Women in Math, http://wim.math.umd.edu/programs.php, 2008, Note: I was only responsible for the content.
- Norbert Wiener Center Seminar, http://www.math.umd.edu/research/seminars/wavelets/, 2007

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Emily J. King

Spoken Languages

- English (mother tongue)
- German (Common European Framework of Reference for Languages C1)
- Russian (basic)

Professional Societies

- Pi Mu Epsilon (U.S. honorary national mathematics society), lifetime member
- Dobro Slovo (National Slavic Honor Society), lifetime member
- AMS (American Mathematical Society), 2004–2011, 2019–Now
- AWM (Association for Women in Mathematics), 2004–2005, 2008–2011, 2019–Now
- GAMM (Gesellschaft für angewandte Mathematik und Mechanik), 2013–Now
- SPIE (International Society for Optics and Photonics), 2013–Now

Erdős Number

My Erdős Number is 3. (Wojciech Czaja → Charles Chui → Paul Erdős).

I also have a number of paths of length 4,

- Wojciech Czaja → Guido Weiss → Svante Janson (+1 additional coauthor of Weiss with Erdős Number 1) → Paul Erdős
- Wojciech Czaja → Mauro Maggioni → Charles Chui → Paul Erdős
- Gitta Kutyniok → David Donoho → Craig A. Tovey → Paul Erdős
- Gitta Kutyniok → Robert Calderbank → Peter C. Fishburn (+ 9 additional coauthors of Calderbank with Erdős Number 1) → Paul Erdős
- Maria Skopina → Sergei V. Konyagin → Carl Pomerance (+7 additional coauthors of Konyagin with Erdős Number 1) → Paul Erdős

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