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St. Louis University
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- PROFESSIONAL APPOINTMENTS **St. Louis University**, St. Louis, MO, USA
Assistant Professor, August 2012 - current.
- University of Texas**, Austin, TX, USA
R. H. Bing instructor, August 2010 - August 2012.
- Texas A&M University**, College Station, TX, USA
Visiting assistant professor, September 2009 - August 2010.
- EDUCATION **Texas A&M University**, College Station, TX, USA
Ph.D., Mathematics, August 2009
Advisor: Thomas Schlumprecht
Thesis title: Upper estimates for Banach spaces
- Guilford College**, Greensboro, NC, USA
B.S., Mathematics and Physics, May 2003
Advisors: Ruddy Gordh and Elwood Parker
Thesis title: Ellipsoidal and convex tight frames.
- RESEARCH INTERESTS Functional analysis, Geometry of Banach spaces, Frames.
- RESEARCH PAPERS
22. *The discretization problem for continuous frames.* (with D. Speegle), 23 pages, submitted.
21. *Closed ideals of operators between the classical sequence spaces.* (with Th. Schlumprecht and A. Zsak), 18 pages, accepted in Bulletin of the London Math. Soc.
20. *On spreading sequences and asymptotic structures.* (with E. Odell, B. Sari, and B. Zheng), 25 pages, accepted in Transactions of the AMS.
19. *Classes of operators determined by ordinal indices.* (with K. Beanland, R. Causey, and B. Wallis), J. Functional Analysis, **271** (2016), no. 1, 1691-1746.
18. *Weaving Schauder frames.* (with P. Casazza and R. Lynch), J. Approximation Theory, **211** (2016), 42-60.

17. *The metric geometry of the Hamming Cube and applications.* (with F. Baudier, Th. Schlumprecht, and A. Zsak), *Geometry and Topology* **20** (2016), 1427-1444.
16. *The stabilized set of p 's in Krivine's Theorem can be disconnected* (with K. Beanland and P. Motakis), *Advances Math*, **281** (2015), 553-577.
15. *Upper and lower estimates for Schauder frames and atomic decompositions.* (with K. Beanland and R. Liu), *Fund. Math.* **231** (2015), 161-188.
14. *Moving finite unit norm tight frames for S^n .* (with R. Hotovy, E. Martin), *Illinois J. Math.*, **58** (2014), no. 2, 311-322.
13. *Unconditional structures of translates for $L_p(\mathbb{R}^d)$.* (with E. Odell, Th. Schlumprecht, and A. Zsak), *Israel J. Math.*, **203** (2014), no. 1, 189-209.
12. *A weak Grothendieck compactness principle for Banach spaces with a Symmetric Basis.* (with P.N. Dowling, C.J. Lennard, E. Odell, B. Randrianantoanina, and B. Turett), *Positivity*, **18** (2014), no. 1, 147-159.
11. *Uniformly factoring weakly compact operators.* (with K. Beanland), *J. Functional Analysis*, **266** (2014), no. 5, 2921-2943.
10. *Equilateral sets in uniformly smooth Banach spaces.* (with E. Odell, B. Sari and Th. Schlumprecht), *Mathematika*, **60** (2014), no. 01, 219-231.
9. *Moving Parseval frames for vector bundles.* (with D. Poore, R. Wei, M. Wyse), *Houston J. of Math.*, **40** (2014), no. 3, 817-832.
8. *A Weak Grothendieck compactness principle.* (with P.N. Dowling, C.J. Lennard, E. Odell, B. Randrianantoanina, B. Turett), *J. Functional Analysis* **263** (2012), no. 5, 1378-1381.
7. *Embedding uniformly convex spaces into spaces with very few operators.*(with S.A. Argyros, R.G. Haydon, E. Odell, Th. Raikoftsalis, Th. Schlumprecht and D.Z. Zisimopoulou), *J. Functional Anal.* **262** (2012), no. 3, 825-849.
6. *Ordinal Ranks on Weakly Compact and Rosenthal Operators.* (with K. Beanland), *Extracta Mathematicae*, **26** (2) (2011), 173-194.
5. *Greedy bases for Besov spaces.* (with S. Dilworth, E. Odell, Th. Schlumprecht), *Constructive Approx.* **34** (2011), no. 2, 281-296.
4. *The universality of ℓ_1 as a dual space.* (with E. Odell, Th. Schlumprecht), *Math. Annalen.* **351** (2011), no. 1, 149-186.

3. *Banach spaces of bounded Szlenk index II* (with E. Odell, Th. Schlumprecht, A. Zsak), *Fundamenta Math.* **205** (2009) 161–177.
2. *Weakly null sequences with upper estimates*. *Studia Math.* **184** (2008), no. 1, 79–102.
1. *Ellipsoidal tight frames and projection decompositions of operators*. (with K. Dykema, K. Kornelson, D. Larson, M. Ordower, E. Weber), *Illinois J. Math.* **48** (2004), no. 2, 477–489.

AWARDS

Simons Foundation Collaboration Grant for Mathematicians, "Coordinate systems of Banach spaces", 353293, \$35,000, Sep 2015-Aug 2020.

National Science Foundation Research Grant, "Topics in the geometry of Banach spaces", DMS-1001929, \$76,443, June 2010-May 2014.

Faculty Travel Grant, \$1,200, University of Texas at Austin, 2011.

R.H. Bing fellowship, \$7,000 per year and \$1,000 travel allowance per year, University of Texas at Austin, 2010-2013

Mathematical Association of America Project NExT fellow, 2010-2011.

L.F. Guseman Prize in Mathematics Award, Texas A&M University, 2009. Given for outstanding research, teaching, and service as a graduate student.

AUF Fellowship, Texas A&M University, Sep 2004-Aug 2005 and Sep 2006-Aug 2009.

NSF-VIGRE Fellowship, Texas A&M University, Sep 2003-Aug 2004 and Sep 2005-Aug 2006.

The Learning Commons Outstanding Tutor Award, Guilford College, 2003. Given to the tutor who has contributed in the most positive, responsible, and creative ways.

RESEARCH **Masters thesis**, *Continuous Schauder Frames and Reflexivity in Banach Spaces*,
 MENTORED AND Joseph Eisner, St Louis University 2016- 2017.

INDEPENDENT

STUDY DIRECTED **Honors senior thesis**, *Global Coordinate Systems: Continuously Moving Finite-Dimensional Unit Norm Tight Frames on Smooth Manifolds*, Eileen Martin, University of Texas, Austin 2011-2012. Eileen received a Goldwater fellowship for this project.

Independent study in number theory, Ashton Grimal, University of Texas, Austin Fall 2011.

Wavelets and matrix analysis REU, Eileen Martin and Ryan Hotovy, Texas A&M Summer 2010. Created and mentored research project on finite unit norm tight frames on manifolds.

Graduate Independent study in Banach spaces, Mitch Phillipson and Casey Rodriguez, Texas A&M Summer 2010.

Wavelets and matrix analysis REU, Daniel Poore, Rebecca Wei and Madeline Wyse, Texas A&M Summer 2009. Created and mentored research project on moving Parseval frames for vector bundles.

INVITED TALKS

Spring Eastern sectional meeting of the AMS, Special session on Banach Space Theory and Metric Embeddings, Hunter College, *Title: The discretization problem for continuous frames.* , May 2017.

INFAS, Creighton University, *Title: The discretization problem for continuous frames*, April 2017.

Spring Southeastern sectional meeting of the AMS, Special session on Frame theory, College Of Charleston, *Title: The discretization problem for continuous frames and coherent states.* , March 2017.

Joint Mathematics Meeting, Special session on Bases in Function Spaces: Sampling, Interpolation, Expansions and Approximations, Atlanta GA, *Title: The discretization problem for continuous frames and coherent states*, January 2017.

Workshop in Analysis and Probability, Texas A&M University, *Title: The Discretization Problem for continuous frames* , July 2016.

International Workshop on Operator Theory and Applications, Washington University in St Louis, *Title: The Discretization Problem for continuous frames*, July 2016.

Karcher Colloquium, University of Oklahoma, *Title: Coordinate systems formed by translations of a single function in $L_p(\mathbb{R})$* , April 2016.

Frames seminar, University of Oklahoma, *Title: Discrete and Continuous frames*, April 2016.

Guilford physics reunion, Guilford College, *Title: The discretization problem in math and physics*, April 2016.

Fall Central sectional meeting of the AMS, Special session on Banach Spaces and Applications, University of Memphis *Title: Weaving bases and frames for Banach spaces.*, October 2015.

Workshop in Analysis and Probability, Texas A&M University, *Title: Weaving bases and frames for Banach spaces.*, July 2015.

Spring Central sectional meeting of AMS, Special session on Frames, Wavelets, and their Applications, Michigan State, *Title: An unconditional FDD of translations of a single function for L_p for $p > 2$* , March 2015.

Undergraduate Analysis Seminar, Washington and Lee University, *Title: The Hairy Ball Theorem*, October 2014.

Analysis Seminar, National Technical University of Athens, *Title: Coordinate systems of translations of a single function in $L_p(\mathbb{R})$* , June 2014.

7th Conference on Function Spaces, Southern Illinois University Edwardsville, *Title: Unconditional coordinate systems formed by translations of a single function in $L_p(\mathbb{R})$* , May 2014.

5th International Conference on Computational Harmonic Analysis, Vanderbilt University, *Title: Coordinate systems of translates of a single function in $L_p(\mathbb{R})$* , May 2014.

Colloquium talk, University of Miami Ohio, *Title: Redundant frames on Manifolds*, November 2013.

Fall Central sectional meeting of AMS, Special session on Wavelets, Frames, and Related Expansions, Washington University in St Louis, *Title: Dilations of Schauder frames for Banach spaces*, October 2013.

Workshop in Analysis and Probability, The Mathematical Legacy of Ted Odell, Texas A&M University, *Title: Greedy bases for Besov spaces*, August 2013.

Banach Spaces: Geometry and Analysis, Memorial Conference for Joram Lindenstrauss, Hebrew University, *Title: Equilateral sets in uniformly smooth Banach spaces*, May 2013.

Spring Southeastern sectional meeting of AMS, University of Mississippi, *Title: Equilateral sets in uniformly smooth Banach spaces*, invited talk, Special session on Banach Spaces and Operators on Them, March 2013.

Larsonfest: Operator Algebras, Frames, and Undergraduate Research, Texas A&M University, *Title: Frames of integer translates for $L_p(\mathbb{R})$ with $2 < p$* , July 2012.

ICOMAS conference, session on Banach Space Theory and Applications in memory of Nigel Kalton, University of Memphis *Title: A frame of integer translates of a single function for $L_p(\mathbb{R})$ with $2 < p < \infty$* , May 2012.

Workshop on Banach space theory, Banff International Research Station, *Title: Embedding into BD spaces and spaces with very few operators*, March 2012.

Millican-Colloquium, University of North Texas, *Title: Embedding Banach spaces and factoring operators*, October 2011.

Workshop in Analysis and Probability, Texas A&M University, *Title: Shrinking and boundedly complete Schauder frames for Banach spaces*, July 2011.

Summer meeting of the CMS, session on "Banach Spaces and Operators Between Them", University of Alberta, *Schauder frames for Banach spaces*, June 2011.

Joint Linear Analysis/Banach space Seminar, Texas A&M University, *Title: Weak Grothendieck compactness principles*, May 2011.

Southeastern section meeting of the AMS, Special Session on Geometry of Banach Spaces, University of Richmond, *Title: Redundant frames for vector bundles*, November 2010.

Analysis Seminar, Virginia Commonwealth University, *Title: Redundant frames on manifolds*, September 2010.

VOTCAM, Virginia Commonwealth University, *Title: Greedy bases for Besov spaces*, September 2010.

Linear Analysis Seminar, Texas A&M University, *Title: Embedding into \mathcal{L}_∞ Banach spaces*, April 2010.

Workshop on Optimal Frames and Operator Algebras, San Francisco State University, *Title: Embedding Banach spaces*, January 2010.

SUMIRFAS, Texas A&M University, *Title: The universality of ℓ_1 as a dual space*, August 2009.

Workshop on analysis and probability, Texas A&M University, *Title: A greedy basis for $(\sum \ell_p^n)_{\ell_q}$* , July 2009.

Analysis seminar, University of Texas, *Title: The universality of ℓ_1 as a dual space*, October 2008.

IMST conference, session on Banach Space Theory and Applications, University of Memphis *Title: Weakly null sequences with upper estimates*, May 2008.

DEPARTMENTAL SERVICE Faculty advisor of the Mathematics and Computer Science club at St Louis University Fall 2014-present.

CONFERENCES ORGANIZED

Special session on Linear and Non-linear Geometry of Banach Spaces, Fall Central Sectional Meeting of the AMS, Washington University in St Louis, October 2013. co-organized with N. Randrianarivony.

The Mathematical Legacy of Ted Odell (created conference website), Texas A&M University, June 2013. Organized by Th. Schlumprecht.
Website: math.slu.edu/~freeman/LegacyConference

Greedy algorithms in Banach spaces and compressed sensing, concentration week in the workshop on analysis and probability, Texas A&M University, July 2011. co-organized with S. Dilworth, D. Kutzarova, E. Odell and Th. Schlumprecht. Website: math.slu.edu/~freeman/greedy11

Panel discussion on undergraduate research, Project NExT panel at the 2011 Joint Mathematics Meeting, January 2011. co-organized with J. Jacobs, K. Roinestad, and A. Yust.

JOURNAL REFERENCE Proceedings of the American Mathematical Society, Bulletin of the London Mathematical Society, Journal of Functional Analysis, Journal of Approximation Theory, Comptes Rendus Mathematique, Mathematische Annalen, Journal of Mathematical Analysis and Applications, Mathematika, Positivity, Studia Mathematica, American Mathematical Monthly, Nonlinear Analysis Series B: Real World Applications, Bulletin of the Polish Academy of Sciences, Monatshefte für Mathematik, and Bulletin of the Korean Mathematical Society.

JUDGE

2015 GSA Graduate Research Symposium judge at St Louis University.

Region two judge for 2011 Siemens competition in math, science and technology.

Undergraduate research poster session judge for 2011 Joint mathematics meeting.

TEACHING
EXPERIENCE

St Louis University.

Linear Algebra for Engineers, Spring 2017.
Principles of Mathematics, Spring 2017.
Calculus I, Fall 2016.
Principles of Mathematics, Fall 2016.
Graduate Functional Analysis, Spring 2016.
Principles of Mathematics, Spring 2016.
Graduate Real Analysis I, Fall 2015.
Principles of Mathematics, Fall 2015.
Survey of Calculus with Excel, Spring 2015.
Principles of Mathematics, Spring 2015.
Principles of Mathematics, Fall 2014.
Discrete Mathematics, Fall 2014.
Metric Spaces, Spring 2014.
Principles of Mathematics, Spring 2014.
Introduction to Real Analysis, Fall 2013.
Calculus I, Fall 2013.
Principles of Mathematics, Spring 2013.
Calculus I, Fall 2012.
Calculus I, Fall 2012.

University of Texas, Austin.

Discrete Mathematics, Spring 2012.
Introduction to Number Theory, Fall 2011.
Differential Calculus, Fall 2011.
Independent Study on Number Theory, Fall 2011.
Honors Senior Thesis on Frames and Vector Bundles, Fall 2011-Spring 2012.
Introduction to Number Theory, Spring 2011.
Differential and Integral Calculus, Fall 2010.
Discrete Mathematics, Fall 2010.

Texas A&M University.

Independent study on Banach spaces, Summer 2010.
REU on Wavelets and Matrix Analysis, Summer 2010.
Calculus I for Engineers, Spring 2010.
Calculus III for Engineers, Fall 2009.
REU on Wavelets and Matrix Analysis, Summer 2009.
Business Mathematics II, Summer 2008.