

## Brett D. Wick

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### Education:

#### Brown University, Providence, Rhode Island

Ph.D. in Mathematics, June 2005

Sc.M. in Mathematics, May 2003

#### University of Houston, Houston, Texas

B.S. in Mathematics, May 2001

Minor in Physics, May 2001

### Professional Experience:

Associate Professor of Mathematics, Georgia Institute of Technology, Fall 2012 – Present.

Assistant Professor of Mathematics, Georgia Institute of Technology, Fall 2009 – Summer 2012.

Palmetto Assistant Professor of Mathematics, University of South Carolina, Fall 2007 – Summer 2009.

Assistant Professor of Mathematics, Vanderbilt University, Fall 2005 – Summer 2007.

### Teaching Experience:

#### Georgia Institute of Technology:

Graduate Real Analysis II, Spring 2012.

Graduate Real Analysis I, Fall 2011.

Graduate Complex Analysis, Spring 2011.

Analytic Function Theory, Fall 2010.

Calculus III, Fall 2009.

Calculus III for Computer Scientists, Fall 2009.

## Research:

### Research Interests:

Harmonic Analysis      Several Complex Variables  
Function Theory          Operator Theory

### Awards and Honors:

NSF CAREER Award, Fall 2010 – Spring 2015.  
Alexander von Humboldt Research Fellow, Spring 2010 – Spring 2012.  
Bucknell Distinguished Visiting Professor, Fall 2009, Fall 2010.  
Professeur Invité, Université Paul Verlaine – Metz, Summer 2009.  
Jerrold E. Marsden Postdoctoral Fellow, Fields Institute, Spring 2008.  
Wallenberg Postdoctoral Fellow, Swedish Royal Institute of Technology, Fall 2007.  
Young Investigator: Workshop in Analysis and Probability, Texas A & M University, Summer 2006.

### Grants Awarded:

1. National Science Foundation – DMS # **1200994** “The Corona Problem: Connections Between Operator Theory, Function Theory and Geometry”, 11/01/11 – 10/31/2012, \$18,000.
2. National Science Foundation – DMS # **1001098** “Function Theory and Operator Theory via Harmonic Analysis on the Polydisc”, 06/01/10 – 07/31/12, \$53,003.
3. National Science Foundation – DMS # **0955432** “CAREER: An Integrated Proposal Based on the Corona Problem”, 08/01/10 – 07/31/15, \$449,439.
4. National Science Foundation – DMS # **0969431** “SEAM XXVI Georgia Institute of Technology Spring 2010”, 01/01/10 – 12/31/10, \$24,300.
5. National Science Foundation – DMS # **0752703** “Investigations on the Corona Problem and a Study of Multi-Parameter Harmonic Analysis”, 08/16/07 – 07/31/09, \$58,907.
6. National Science Foundation – DMS # **0555896** “Investigations on the Corona Problem and a Study of Multi-Parameter Harmonic Analysis”, 08/16/06 – 07/31/09, \$80,867.

### Publications:

#### In Preparation:

1. An Estimate for Ideals in the Multiplier Algebras for the Drury-Arveson Hardy space and other holomorphic Besov-Sobolev spaces on the unit ball in  $\mathbb{C}^n$ , (with M. Mitkovski and E. Sawyer).
2. Asymptotic Interpolating Sequences for  $H^\infty(\mathbb{D})$ : A New Constructive Proof of the Characterization, (with. P. Gorkin).

3. Uniqueness Sets in the Fock Space, (with M. Mitkovski).
4. Function Spaces on Multiparameter Trees, (with E. Sawyer).

**Preprints:**

1. Schatten Estimates for Paraproducts and Hankel Operators in One and Several Parameters (with M. Lacey).

**Submitted:**

1. Bergman-type Singular Integral Operators on Metric Spaces, (with A. Volberg) *submitted to Conference Proceedings* (10-19-11).
2. Some Remarks about Interpolating Sequences in Reproducing Kernel Hilbert Spaces (with M. Ragupathi) *submitted to Houston J. Math.* (10-25-11).
3. Potential theory on trees, graphs and Ahlfors regular metric spaces (with N. Arcozzi, R. Rochberg, and E. Sawyer), *submitted to Potential Analysis* (07-14-11).

**Accepted or Published:**

1. Multi-Parameter Div-Curl Lemmas and Applications (with M. Lacey, S. Petermichl and J. Pipher), *Bulletin London Math. Soc.*, *to appear*.
2. Corrigenda: “Stabilization in  $H_{\mathbb{R}}^{\infty}(\mathbb{D})$ ”, *Publ. Mat.* **55** (2011), no. 1, 251–260.
3. The Dirichlet Space: A Survey, (with N. Arcozzi, R. Rochberg, E. Sawyer) *Proceedings of Recent Advances in Function Theoretic Operator Theory*, *New York J. Math.* **17a** (2011), 45–86.
4. Distance Functions for Reproducing Kernel Hilbert Spaces, (with N. Arcozzi, R. Rochberg, E. Sawyer), *Proceedings of the Sixth Conference on Function Spaces*, *Contemp. Math.* **547**, Amer. Math. Soc., Providence, RI, 2011, 25–53.
5. The Corona Theorem for the Drury-Arveson Hardy space and other holomorphic Besov–Sobolev spaces on the unit ball in  $\mathbb{C}^n$  (with Ş. Costea and E. Sawyer), *Anal. PDE*, **4** (2011), no. 4, 499–550.
6. Function Spaces Related to the Dirichlet Space (with N. Arcozzi, R. Rochberg and E. Sawyer), *J. London Math. Soc. (2)* **83** (2011), no. 1, 1–18.
7. Bergman-type Singular Operators and the Characterization of Carleson Measures for Besov–Sobolev Spaces on the Complex Ball, (with A. Volberg), *Amer. J. Math.*, *to appear*.
8. Topological Stable Rank of  $H^{\infty}(\Omega)$  for Circular Domains  $\Omega$  (with R. Mortini, A. Sasane and R. Rupp), *Anal. Math.* **36** (2010) no. 4, 287–297.
9. Duality, Tangential Interpolation, and Töplitz Corona Problems, (with M. Ragupathi), *Integral Equations Operator Theory* **68** (2010), no. 3, 337–355.
10. BMO Estimates for the  $H^{\infty}(\mathbb{B}_n)$  Corona Problem (with Ş. Costea and E. Sawyer), *J. Funct. Anal.* **258** (2010), no. 11, 3818–3840.

11. Bilinear Forms on the Dirichlet Space (with N. Arcozzi, R. Rochberg and E. Sawyer), *Anal. PDE* **3** (2010), no. 1, 21–47.
12. Spectral Characteristics and Stable Ranks for the Sarason Algebra  $H^\infty + C$  (with R. Mortini), *Michigan Math. J.* **59** (2010), no. 2, 395–409.
13. Iterated Riesz Commutators: A Simple Proof of Boundedness (with M. Lacey, S. Petermichl, J. Pipher), *Harmonic Analysis and Partial Differential Equations*, *Contemp. Math.* **505**, Amer. Math. Soc., Providence, RI, 2010, 171–178.
14. New Estimates for the Beurling-Ahlfors Operator on Differential Forms (with S. Petermichl and L. Slavin), *J. Operator Theory* **65** (2011), no. 2, 307–324.
15. Composition of Haar Paraproducts: The Random Case (with D. Bilyk, M. Lacey, and X. C. Li), *Anal. Math.* **35** (2009), no. 1, 1–13.
16. Simultaneous Stabilization in  $A_{\mathbb{R}}(\mathbb{D})$  (with R. Mortini), *Studia Math.* **191** (2009), no. 3, 223–235.
17. Stabilization in  $H_{\mathbb{R}}^\infty(\mathbb{D})$ , *Publ. Mat.* **54** (2010), no. 1, 25–52.
18. Toeplitz Corona Theorems for the Polydisk and the Unit Ball (with T. Trent), *Complex Anal. Oper. Theory* **3** (2009), no. 3, 729–738.
19. The Bass and Topological Stable Ranks of  $H_{\mathbb{R}}^\infty(\mathbb{D})$  and  $A_{\mathbb{R}}(\mathbb{D})$  (with R. Mortini), *J. Reine Angew. Math.* **636** (2009), 175–191.
20. Multi-Parameter Riesz Commutators (with M. Lacey, S. Petermichl, and J. Pipher), *Amer. J. Math.* **131** (2009), no. 3, 731–769.
21. The Corona Theorem for  $\mathbb{C} + BH^\infty$ , (with R. Mortini and A. Sasane), *Houston J. Math.* **36** (2010), no. 1, 289–302.
22. Analytic Projections, Corona Problem and Geometry of Holomorphic Vector Bundles (with S. Treil), *J. Amer. Math. Soc.* **22** (2009), no. 1, 55–76.
23. Carleson Potentials and the Reproducing Kernel Thesis for Embedding Theorems (with S. Petermichl and S. Treil), *Illinois J. of Math.* **51** (2007), no. 4, 1249–1263.
24. A Weighted Estimate for the Square Function on the Unit Ball of  $\mathbb{C}^n$  (with S. Petermichl), *Ark. Mat.* **45** (2007), no. 2, 337–350.
25. A Note About Stabilization in  $A_{\mathbb{R}}(\mathbb{D})$ , *Math. Nachr.* **282** (2009), no. 6, 912–916.
26. Remarks on Product VMO (with M. Lacey and E. Terwilleger), *Proc. Amer. Math. Soc.* **134** (2006), no. 2, 465–474.
27. The Matrix-Valued  $H^p$  Corona Problem for the Disk and Polydisk (with S. Treil), *J. Funct. Anal.* **226** (2005), no. 1, 138–172.

**Books Edited:**

1. “Recent Advances in Harmonic Analysis and Applications: In Honor of Konstantin Oskolkov” (with D. Bilyk, L. DeCarli, and A. Stokolos), Springer Proceeding in Mathematics.

## **Seminars, Conferences and Workshops:**

### **Talks:**

#### **Colloquium Talks:**

Trinity University, Spring 2012.  
University of Cincinnati, Spring 2012  
Washington University, St. Louis, Spring 2012.  
University of Alabama, Fall 2011.  
Bucknell University (2 talks), Fall 2010.  
Bucknell University (2 talks), Fall 2009.  
University of Houston, Spring 2009.  
Texas A & M University, Spring 2007, Spring 2009.  
University of South Florida, Spring 2009.  
Georgia Institute of Technology, Spring 2009.  
University of Tennessee – Knoxville, Spring 2007.  
University of South Carolina, Spring 2007.  
University of Alabama – Tuscaloosa, Spring 2007.

#### **Seminar Talks:**

University of Cincinnati, Spring 2012.  
Georgia Institute of Technology Undergraduate Seminar, Fall 2010, Fall 2011.  
Brown University Analysis Seminar, Spring 2004, Fall 2004, Spring 2005, Fall 2008, Fall 2011.  
Washington University - St. Louis Analysis Seminar, Fall 2011.  
Kansas State University Analysis Seminar, Fall 2011.  
Georgia Institute of Technology Research Horizons Seminar, Fall 2009, Fall 2009, Spring 2011.  
Kennesaw University Analysis Seminar, Fall 2010.  
Norwegian University of Science and Technology, Department of Mathematical Sciences, Trondheim, Norway, Spring 2010.  
Georgia Institute of Technology Analysis Seminar, Fall 2004, Fall 2005, Fall 2006, Fall 2008, Spring 2010.  
Universidad de Sevilla, Departamento de Análisis Matemático, Spring 2010.  
Université Paul Sabatier, Institut de Mathématiques de Toulouse, Spring 2010.

University of Edinburgh, Spring 2010.

Leibniz University, Hanover, Spring 2010.

University of Paderborn, Spring 2010.

Georgia Institute of Technology, Research Horizons Seminar, Fall 2009.

University of Trento, Spring 2009.

University of Orléans, Spring 2009.

University of Paris 6, Spring 2009.

University of Orsay, Spring 2009.

University of South Carolina, Fall 2008, Spring 2009.

University of Metz, Department of Mathematics Analysis Seminar, Fall 2007, Spring 2009.

Michigan State University, Department of Mathematics Analysis Seminar, Spring 2008, Fall 2008, Spring 2009.

University of Missouri Analysis Seminar, Fall 2008.

University of Houston Analysis Seminar, Fall 2006, Fall 2008.

Texas A & M University Analysis Seminar, Fall 2008.

Cornell University Analysis Seminar, Fall 2005, Spring 2008.

Fields Institute Harmonic Analysis Seminar, Spring 2008.

University of Jyväskylä, Department of Mathematics Analysis Seminar, Fall 2007.

University of Helsinki, Department of Mathematics Analysis Seminar, Fall 2007.

London School of Economics, Department of Mathematics CDAM Seminar, Fall 2007.

The Royal Institute of Technology (KTH), Department of Mathematics Analysis Seminar, Fall 2007.

Vanderbilt University, Fall 2005, Spring 2007.

University of Tennessee – Knoxville Analysis Seminar, Fall 2005.

**Conference and Workshop Talks:**

Plenary Speaker, Banach Algebras 2013, Gothenburg, Sweden, July 29 - August 4, 2013, upcoming.

Plenary Speaker, Recent Advances in Operator Theory and Operator Algebras, Bangalore, India, December 31 2012 - January 2013, upcoming.

Mini-Course Instructor, Recent Advances in Harmonic Analysis and Spectral Theory, Texas A&M University, August 6-10, 2012, upcoming.

Plenary Speaker, 24th International Conference on Operator Theory, Timisoara, Romania, July 2-7 2012, upcoming.

Plenary Speaker, Great Plains Operator Theory Symposium, University of Houston, May 29 - June 3, 2012, upcoming.

Plenary Speaker, Frames and Bases of Analytic Functions, Toulouse, France, May 23-25 2012, upcoming.

Operator Related Function Theory, Erwin Schrödinger Institute, Vienna, Austria, March 26-31 2012, upcoming.

American Mathematics Society Spring Sectional Meeting, Special Session on Holomorphic Spaces, University of Hawaii, March 3-4 2012.

American Mathematics Society Joint Mathematics Meeting 2012, Special Session on Several Complex Variables and Multivariable Operator Theory, Boston, January 4-7 2012.

American Mathematics Society Fall Sectional Meeting, Special Session on Multivariable Operator Theory, Cornell University, September 10-11 2011.

Approximation Theory and Harmonic Analysis Workshop, Kennesaw State University, May 14-15, 2011.

Second Buea International Conference on the Mathematical Sciences, Buea, Cameroon May 8-13 2011.

Plenary Speaker, Southeastern Analysis Meeting (SEAM) XXVII, University of Florida, March 17-19 2011.

Invited Address, American Mathematics Society Southeast Sectional Meeting, Georgia Southern University, March 12-13, 2011.

Waves and Spectra, Texas A & M University, January 11-14, 2011.

Wellposedness and Controllability of Evolution Equations, Oberwolfach, December 12-18 2010.

Operator Theory and Harmonic Analysis, Oberwolfach Conference, October 31 - November 6 2010.

American Mathematics Society Fall Sectional Meeting, Special Session on Harmonic Analysis, Syracuse University, October 2-3 2010.

Multivariate Operator Theory, Banff International Research Station, August 15-20 2010.

Harmonic Analysis: A Retrospective Workshop, Fields Institute, May 31 - June 4 2010.

Plenary Speaker, UK Harmonic Analysis and PDE Research Network, Glasgow, February 23 2010.

Auburn Conference on Harmonic Analysis and Related Topics, December 3-5 2009.

Workshop on Operator Theory and Applications, International Centre of Mathematical Sciences, Edinburgh, September 7-11 2009.

Seminar for the Research Programme: Harmonic Analysis, Geometric Measure Theory and Quasiconformal Mappings, May 10-25 2009.

Hilbert Modules and Complex Geometry, Oberwolfach Conference, April 6-10 2009.

Auburn Conference on Harmonic Analysis and Related Topics, November 20-22 2008.

St. Petersburg Summer Meeting in Mathematical Analysis, June 23 -27 2008.

Seminar at the Workshop in Analysis and Probability, Texas A & M University, Summer 2005, Summer 2006, Summer 2008.

American Mathematics Society Spring Sectional Meeting, Special Session on Harmonic Analysis, University of Indiana – Bloomington, April 5-6 2008.

Southeastern Analysis Meeting (SEAM) XXIII, University of Richmond, March 9-11 2007.

Prairie Analysis Seminar, October 13-14 2006.

Plenary Speaker, Southeastern Analysis Meeting (SEAM) XXII, University of Florida, March 2-5 2006.

International Workshop on Operator Theory and its Applications (IWOTA), Newcastle England, July 12-16 2004.

### **Conference and Workshop Participation:**

Weighted Inequalities for Singular Integral Operators, American Institute of Mathematics, October 10-14, 2011.

Southeastern Analysis Meeting (SEAM) XXVI, Georgia Institute of Technology, March 2010.

Centro Internazionale per la Ricerca Matematica Research in Pairs: Bilinear Forms on Spaces of Analytic Functions, Trento, Italy, June 14-28 2009.

Harmonic Analysis, Geometric Measure Theory and Quasiconformal Mappings, May 10-25 2009.

Oberwolfach, Research in Pairs: Logarithmic Mean Oscillation and Hankel Operators, March 23 - April 4 2009.

Small Ball Inequalities in Analysis, Probability, and Irregularities of Distribution, American Institute of Mathematics, December 7-13 2008.

Workshop in Analysis and Probability, Texas A & M University, Summer 2005, Summer 2006, Summer 2008.

Function Spaces and Their Operators, A Conference in Honor of Richard Rochberg, Washington University – St. Louis, May 28-31 2008.

Southeastern Analysis Meeting (SEAM) XXIV, Vanderbilt University, March 5-9 2008.

Thematic Program on New Trends in Harmonic Analysis, Fields Institute, January – June 2008.

Potential Theory and its Applications, A Conference in Honor of Björn Gustafsson, The Royal Institute of Technology (KTH), October 17 2007.

The Kadison-Singer Problem, American Institute in Mathematics, September 25-29 2006.

Shanks Workshop: Composition of Haar Paraproducts, Vanderbilt University, May 20-21 2006.

BANFF-PIMS, Research in Teams: Multi-Parameter Nehari Theorems, March 20-24 2006.

Workshop on Multi-Scale Geometry and Analysis in High Dimensions, Institute for Pure and Applied Mathematics, UCLA, November 8-12 2004.

Summer School on Hamiltonian Mechanics and Integrable Systems, UCLA/Cal Tech, September 12-17 2004.

NSF/CBMS Regional Conference in Mathematical Sciences: Wave packets, Multi-linear Operators and Carleson Theorems, Georgia Tech, May 23-28 2004.

Park City Mathematics Institute Summer School on Harmonic Analysis and Partial Differential Equations, Park City, Utah, June 29 - July 19 2003.

Spring School on Analysis in Paseky, Czech Republic, June 1-7 2003.

### **Conferences and Workshops Organized:**

The Corona Problem: Connections between Operator Theory, Function Theory and Geometry, Fields Institute, June 18-22 2012, upcoming.

MSRI Summer Graduate Workshop “The Dirichlet Space: Connections between Operator Theory, Function Theory, and Complex Analysis”, June 20 - July 1 2011.

Centre International de Mathématiques Pures et Appliquées (CIMPA School): “Real and Complex Analysis with Applications to other Sciences”, Buea (Cameroon), May 1-14 2011.

Special Session: Harmonic Analysis and Applications, American Mathematics Society Southeast Sectional Meeting, Georgia Southern University, March 12-13, 2011.

Southeastern Analysis Meeting (SEAM) XXVI, Georgia Institute of Technology, March 25-28 2010.

Centro Internazionale per la Ricerca Matematica Research in Pairs: Bilinear Forms on Spaces of Analytic Functions, Trento, Italy, June 14-28 2009.

Oberwolfach, Research in Pairs: Logarithmic Mean Oscillation and Hankel Operators, March 23- April 4 2009.

Southeastern Analysis Meeting (SEAM) XXIV, Vanderbilt University, March 5-9 2008.

Shanks Workshop: Composition of Haar Paraproducts, Vanderbilt University, May 20-21 2006.

BANFF-PIMS, Research in Teams: Multi-Parameter Nehari Theorems, March 20-24 2006.

## Professional Service:

### Scholarly Service:

### Referee and Review Service:

Member of the NSF Panel for the Analysis Program (2).

Reviewer for Israel Science Foundation Grant Proposals.

Reviewer for NSF Grant Proposals.

External Reviewer for PhD Thesis, University of Helsinki.

Reviewer for Math Reviews (15).

Reviewer for Zentralblatt Math (29).

Referee for: Bull. Korean Math. Soc., Canad. J. Math., Canad. Math. Bull., Complex Anal. Oper. Theory (4), Complex Var. Elliptic Equ., Houston J. Math. (2), Indiana Math. J., Integral Equations Operator Theory (3), J. Fourier Anal. Appl., J. Franklin Inst., J. Funct. Anal. (3), J. Funct. Spaces Appl., J. Geo. Anal. (2), J. London Math. Soc., J. Reine Angew. Math., Math. Nachr. (2), Math. Res. Lett., Potential Anal., Oper. Matrices, Proc. Amer. Math. Soc. (3), Rev. Mat. Iberoam., Trans. Amer. Math. Soc. (2), Misc. Conference Proceedings (2).

### Editorial Service:

Editor for IMHOTEP: African Journal of Pure and Applied Mathematics.

### Departmental Service:

#### Georgia Institute of Technology:

School of Mathematics Colloquium Committee, Fall 2011, Spring 2012.

School of Mathematics Graduate Committee, Spring 2012.

School of Mathematics Thesis Committee: Maria Reguera-Rodriguez, Spring 2011.

Organizer of Analysis Seminar, Fall 2009, Fall 2010, Spring 2011, Fall 2011, Spring 2012.

School of Mathematics Oral Exam Committee: Maria Reguera-Rodriguez, Fall 2010.

## Mentoring Activities:

### Postdocs Mentored:

**Mishko Mitkovski**, Georgia Institute of Technology, Fall 2010 – Present.

Svetlana Poznanovik, Georgia Institute of Technology, Fall 2011 – Present (teaching).

Esma Yildiz Özkan, Gazi Scholar, Georgia State University, Spring 2012.

**Students Advised:**

**James Scurry**, Georgia Institute of Technology, Ph.D., Fall 2008 – Present.

**Membership:**

Member of American Mathematical Society

Mathematical Association of America

Phi Kappa Phi

Omicron Delta Kappa