

Department of Mathematics  
University of North Texas  
1155 Union Circle # 311430  
Denton, TX 76203-5017

Phone: (940) 565-4352 (office)  
*E-mail:* richter@unt.edu  
*web:* <http://www.math.unt.edu/~richter>

## RESEARCH INTERESTS:

Number Theory (discontinuous groups and automorphic forms):  
Jacobi forms, Siegel modular forms, Maass forms, mock theta functions and related objects

## EDUCATION:

**University of California at San Diego**  
Ph.D. in mathematics, May 1999  
Thesis: *Theta functions of quadratic forms*  
Advisor: Prof. H. Stark

**Westfälische Wilhelms Universität Münster, Germany**  
Diploma in mathematics with a minor in computer science, September 1995  
Thesis: *Sums of class numbers and Eisenstein series*  
Advisor: Prof. J. Elstrodt

## ACADEMIC POSITIONS:

**University of North Texas**  
Professor at the Department of Mathematics, 2016–present  
Associate professor at the Department of Mathematics, 2007–2016  
Assistant professor at the Department of Mathematics, 2001–2007

**RWTH Aachen University, Germany**  
Visiting professor (title: *Gastprofessor*) at the Department of Mathematics, 7/1/2008–12/31/2009

**Max Planck Institute for Mathematics in Bonn, Germany**  
Member, 4/1/2009 – 7/31/2009  
Member, 2001–2002 (declined invitation)

**University of California at Santa Cruz**  
Visiting assistant professor at the Department of Mathematics, 1999–2002

## PUBLICATIONS:

- (1) Nonholomorphic Ramanujan-type congruences for Hurwitz class numbers (with O. Beckwith and M. Raum).  
*Proc. Natl. Acad. Sci. USA* **117** (2020), no. 36, 21953–21961.
- (2) The skew-Maass lift I: The case of harmonic Maass-Jacobi forms (with M. Raum).  
*Res. Math. Sci.* **6** (2019), no. 2, 6:22, 59 pp.
- (3) Generators of Jacobi forms are Poincaré series (with H. Skogman).  
*Ramanujan J.* **45** (2018), no. 3, 639–645.
- (4) Almost holomorphic Poincaré series corresponding to products of harmonic Siegel-Maass forms (with K. Bringmann and M. Westerholt-Raum).  
*Res. Math. Sci.* **3** (2016), 3:30, 16 pp.
- (5) Sturm bounds for Siegel modular forms (with M. Westerholt-Raum).  
*Res. Number Theory* **1** (2015), Art. 5, 8 pp.
- (6) Hermitian Jacobi forms and  $U(p)$  congruences (with J. Senadheera).  
*Proc. Amer. Math. Soc.* **143** (2015), no. 10, 4199–4210.
- (7) The structure of Siegel modular forms mod  $p$  and  $U(p)$  congruences (with M. Raum).  
*Math. Res. Lett.* **22** (2015), no. 3, 899–928.
- (8) Harmonic Maass-Jacobi forms with singularities and a theta-like decomposition (with K. Bringmann and M. Raum).  
*Trans. Amer. Math. Soc.* **367** (2015), no. 9, 6647–6670.
- (9) Holomorphic projections and Ramanujan’s mock theta functions (with Ö. Imamoglu and M. Raum).  
*Proc. Natl. Acad. Sci. USA* **111** (2014), no. 11, 3961–3967.
- (10) Kohnen’s limit process for real-analytic Siegel modular forms (with K. Bringmann and M. Raum).  
*Adv. Math.* **231** (2012), no. 2, 1100–1118.
- (11) Jacobi forms over complex quadratic fields via the cubic Casimir operators (with K. Bringmann and C. Conley).  
*Comment. Math. Helv.* **87** (2012), no. 4, 825–859.
- (12) Exact formulas for Fourier coefficients of Jacobi forms (with K. Bringmann).  
*Int. J. Number Theory* **7** (2011), no. 3, 825–833.
- (13) Congruences for Siegel modular forms (with D. Choi and Y. Choie).  
*Ann. Inst. Fourier (Grenoble)* **61** (2011), no. 4, 1455–1466.
- (14) Ramanujan congruences for Siegel modular forms (with M. Dewar).  
*Int. J. Number Theory* **6** (2010), no. 7, 1677–1687.
- (15) Zagier-type dualities and lifting maps for harmonic Maass-Jacobi forms (with K. Bringmann).  
*Adv. Math.* **225** (2010), no. 4, 2298–2315.

- (16) Differential operators and Siegel-Maass forms (with Ö. Imamoglu).  
*Automorphic forms, automorphic representations and related topics*, 109-115, RIMS Kôkyûroku **1715**, Kyoto (2010).
- (17) On congruences of Jacobi forms.  
*Proc. Amer. Math. Soc.* **136** (2008), no. 8, 2729–2734.
- (18) The action of the heat operator on Jacobi forms.  
*Proc. Amer. Math. Soc.* **137** (2009), no. 3, 869–875.
- (19) A combinatorial characterization of Jacobi forms (with Y. Choie).  
*Rocky Mountain J. Math.* **39** (2009), no. 2, 455–462.
- (20) Maass-Jacobi forms over complex quadratic fields (with K. Bringmann and C. Conley).  
*Math. Res. Lett.* **14** (2007), no. 1, 137–156.
- (21) Classification of the space spanned by theta series and applications (with Y. Choie).  
*Proc. Amer. Math. Soc.* **135** (2007), no. 8, 2309–2315.
- (22) Differential operators on Hilbert modular forms (with Y. Choie and H. Kim).  
*J. Number Theory* **122** (2007), no. 1, 25–36.
- (23) On Rankin-Cohen brackets for Siegel modular forms (with Ö. Imamoglu).  
*Proc. Amer. Math. Soc.* **134** (2006), no. 4, 995–1001.
- (24) Jacobi theta functions over number fields (with H. Skogman).  
*Monatsh. Math.* **141** (2004), no. 3, 219–235.
- (25) On transformation laws for theta functions.  
*Rocky Mountain J. Math.* **34** (2004), no.4, 1473–1481.
- (26) Theta functions with harmonic coefficients over number fields.  
*J. Number Theory* **95** (2002), no. 1, 101–121.
- (27) A remark on the behavior of theta series of degree  $n$  under modular transformations.  
*Internat. Math. Res. Notices* **2001**, no. 7, 371–379.
- (28) Theta functions of quadratic forms over imaginary quadratic fields.  
*Acta Arith.* **92** (2000), no. 1, 1–9.
- (29) Theta functions of indefinite quadratic forms over real number fields.  
*Proc. Amer. Math. Soc.* **128** (2000), no. 3, 701–708.

## GRANTS:

### National Science Foundation

- NSF grant DMS 1855261 (co-PI's C. Drescher and A. Shepler) to support the 10<sup>th</sup> meeting of the conference series *Texas-Oklahoma Representations and Automorphic forms (TORA)*, University of North Texas, April 2019.  
Funds awarded: \$16,000.  
Additional support from the University of North Texas: \$10,000.
- NSF Grant DMS 1701585 (PI R. Keaton; co-PI's O. Richter and R. Schmidt) to support the 31<sup>st</sup> *Annual Workshop on Automorphic Forms and Related Topics*, East Tennessee State University, March 2017.  
Funds awarded: \$20,988.
- NSF grant DMS 1600642 (co-PI's E. Drellich and A. Shepler) to support the 7<sup>th</sup> meeting of the conference series *Texas-Oklahoma Representations and Automorphic forms (TORA)*, University of North Texas, April 2016.  
Funds awarded: \$13,000.  
Additional support from the University of North Texas: \$9,400.
- NSF grant DMS 1302770 (co-PI's C. Conley and A. Shepler) to support the 4<sup>th</sup> meeting of the conference series *Texas-Oklahoma Representations and Automorphic forms (TORA)*, University of North Texas, March 2013.  
Funds awarded: \$12,000.  
Additional support from the University of North Texas: \$8,350.
- NSF grant DMS 1153219 to support the international summer school and meeting titled *Building Bridges: 1<sup>st</sup> EU/US conference on Automorphic Forms and Related Topics*, RWTH Aachen University (Germany), July-August 2012.  
Funds awarded: \$50,000.  
Additional support from RWTH Aachen University: €6,000.
- NSF grant DMS 1132586 (co-PI's C. Conley and A. Shepler) to support the 1<sup>st</sup> meeting of the conference series *Texas-Oklahoma Representations and Automorphic forms (TORA)*, University of North Texas, September 2011.  
Funds awarded: \$8,000.  
Additional support from the University of North Texas: \$7,350.
- NSF grant DMS 0847842 (co-PI K. Bringmann) to support the international meeting on *Mock Theta Functions and Applications in Combinatorics, Algebraic Geometry, and Mathematical Physics*, Max Planck Institute for Mathematics in Bonn (Germany), May 2009.  
Funds awarded: \$45,000.  
Additional support from the Max Planck Institute for Mathematics: €20,000.
- NSF grant DMS 0504545 (co-PI H. Rosson) to support the 19<sup>th</sup> *Annual Workshop on Automorphic Forms and Related Topics*, University of North Texas, March 2005.  
Funds awarded: \$10,000.  
Additional support from the University of North Texas: \$15,000.

### National Security Agency

- NSA Grant H98230-16-1-0317 (PI R. Keaton; co-PI's O. Richter and R. Schmidt) to support the 31<sup>st</sup> *Annual Workshop on Automorphic Forms and Related Topics*, East Tennessee State University, March 2017.  
Funds awarded: \$13,980.

## Simons Foundation

- Simons Collaboration Grant #412655  
Title: *Real-analytic automorphic forms and applications*.  
Funding dates: 9/1/2016–8/31/2021.  
Funds awarded: \$35,000.
- Simons Collaboration Grant #200765  
Title: *Jacobi forms and applications*.  
Funding dates: 7/1/2011–8/31/2016.  
Funds awarded: \$35,000.

## UNT Grants

- UNT Faculty Research Grant, 9/1/2010 – 8/31/2011. Funds awarded: \$7,500.
- UNT Faculty Research Grant, 9/1/2006 – 8/31/2007. Funds awarded: \$5,000.
- UNT Faculty Research Grant, 9/1/2005 – 8/31/2006. Funds awarded: \$5,000.
- UNT Faculty Research Grant, 9/1/2004 – 8/31/2005. Funds awarded: \$2,000.
- UNT Faculty Research Grant, 9/1/2003 – 8/31/2004. Funds awarded: \$5,000.
- UNT Faculty Research Grant, 9/1/2002 – 8/31/2003. Funds awarded: \$3,000.
- UNT Junior Faculty Summer Research Fellowship, Summer 2005. Funds awarded: \$5,000.
- UNT Junior Faculty Summer Research Fellowship, Summer 2003. Funds awarded: \$5,000.

## STUDENT ADVISING:

- Advising master's project student Ethan Malmer (graduated from UNT in Spring 2020).  
Title of project: *Representations of sums of three squares along arithmetic progressions*.
- Advised master's project student Michael Hanson (graduated from UNT in Spring 2018).  
Title of project: *Hecke eigenforms and non-ordinary primes*.
- Advised PhD thesis student James Martin (graduated from UNT in Fall 2016).  
Title of thesis: *Rankin-Cohen brackets for Hermitian Jacobi forms and Hermitian modular forms*.
- Advised PhD thesis student Jayantha Senadheera (graduated from UNT in Summer 2014).  
Title of thesis: *Hermitian Jacobi forms and congruences*.
- Advised master's project student Colin VerNooy (graduated from UNT in Spring 2012).  
Title of project: *Theta cycles of modular forms*.
- Advised master's project student Yu Weng (graduated from UNT in Summer 2007).  
Title of project: *The action of the Ramanujan theta operator on modular forms*.
- Advised master's project student Teodor Fatu (graduated from UNT in Summer 2006).  
Title of project: *The modular identity for theta functions and the quadratic reciprocity law*.
- Advised master's thesis student Andrew Vlasic (graduated from UNT in Spring 2004).  
Title of thesis: *A detailed proof of the prime number theorem for arithmetic progressions*.
- Advised senior thesis student David Williams, who won the prize for the best undergraduate thesis in mathematics at the University of California at Santa Cruz, 2001.  
Title of thesis: *Two problems from probabilistic number theory*.

## PRESENTATIONS SINCE 2007:

### Regional Talks

- TORA VIII, Oklahoma State University, April 2017.
- TORA VI, University of Oklahoma, March 2014.
- TORA V, Oklahoma State University, September 2013.
- University of North Texas, Algebra Seminar, February 2013.
- TORA III, University of Oklahoma, September 2012.
- TORA II, Oklahoma State University, April 2012.
- Automorphic Forms and Representation Theory Meeting, Univ. of Oklahoma, October 2010.
- University of North Texas, Algebra Seminar, January 2007.

### Invited National Talks

- AMS Sectional Meeting, special session on Recent Advances and Applications of Modular Forms, Univ. of Hawaii, March 2019.
- Vertex Operator Algebras, Number Theory and Related Topics conference, California State University, Sacramento, June 2018.
- Annual Workshop on Automorphic Forms and Related Topics, Univ. of Michigan, March 2015.
- AMS Sectional Meeting, special session on Automorphic Forms and Modular Forms, Univ. of Hawaii, March 2012.
- AMS Sectional Meeting, special session on Automorphic Forms and Number Theory, UCLA, October 2010.
- Annual Workshop on Automorphic Forms and Related Topics, Univ. of Hawaii, March 2010.
- AMS National Meeting, special session on Automorphic and Modular Forms in Number Theory, Washington DC, January 2009.
- Annual Workshop on Automorphic Forms and Related Topics, Texas A&M Univ., March 2008.
- The Hawaii Workshop on the Arithmetic of Modular Forms, University of Hawaii, May 2008.
- University of Hawaii, Colloquium, January 2007.

### Invited International Talks

- Chalmers University (Sweden), Algebraic Geometry & Number Theory Seminar, May 2019.
- Building Bridges: 2<sup>nd</sup> EU/US conference on Automorphic Forms and Related Topics, University of Bristol (UK), July 2014.
- ETH Zurich (Switzerland), Number Theory Seminar, November 2013.
- Queen's University (Canada), Colloquium, February 2013.
- International meeting on "Explicit Theory of Automorphic Forms, Applications and Computations", Luminy (France), May 2011.
- University of Cologne (Germany), Algebra & Number Theory Seminar, November 2009.
- RWTH Aachen University (Germany), Oberseminar, June 2009.
- Max Planck Institute for Mathematics, Bonn (Germany), Number Theory Seminar, May 2009.
- University of Siegen (Germany), Colloquium, April 2009.
- International Seminar Aachen-Köln-Lille-Siegen on Automorphic Forms, RWTH Aachen University (Germany), January 2009.
- RWTH Aachen University (Germany), Oberseminar, December 2008.
- Pohang University of Science and Technology (South Korea), ANCY Lecture, July 2007.
- International meeting on "Jacobi Forms and Applications", Luminy (France), May 2007.

## PROFESSIONAL SERVICE:

### Organizing

- Co-organizer (with M. Asgari, K. Martin, A. Pitale, R. Schmidt, A. Shepler, and R. Zierau) of the conference series *Texas-Oklahoma Representations and Automorphic forms (TORA)*:  
Co-organizer (with C. Drescher, and A. Shepler) of TORA X, UNT, April 2019.  
Co-organizer (with E. Drellich, A. Shepler, and C. Uhl) of TORA VII, UNT, April 2016.  
Co-organizer (with C. Conley, A. Shepler, and C. Uhl) of TORA I, UNT, September 2011 and TORA IV, UNT, March 2013.
- Co-organizer (with M. Westerholt-Raum) of the special session *Real-Analytic Automorphic Forms*, AMS Sectional Meeting, University of North Texas, September 2017.
- Co-organizer (with R. Keaton and R. Schmidt) of the 31<sup>st</sup> *Annual Workshop on Automorphic Forms and Related Topics*, East Tennessee State University, March 2017.
- Co-organizer (with K. Bringmann and J. Lovejoy) of the international meeting on *Automorphic Forms: Advances and Applications*, Luminy (France), May 2015.
- Co-organizer (with A. Krieg, M. Raum, and L. Walling) of the international summer school and meeting titled *Building Bridges: 1<sup>st</sup> EU/US conference on Automorphic Forms and Related Topics*, RWTH Aachen University (Germany), July–August 2012.
- Co-organizer (with K. Bringmann and D. Zagier) of the international meeting on *Mock Theta Functions and Applications in Combinatorics, Algebraic Geometry, and Mathematical Physics*, Max Planck Institute for Mathematics in Bonn (Germany), May 2009.
- Co-organizer (with K. Bringmann and H. Stark) of the special session *Automorphic Forms and Related Topics*, AMS National Meeting in San Diego, January 2008.
- Co-organizer (with H. Rosson) of the 19<sup>th</sup> *Annual Workshop on Automorphic Forms and Related Topics*, University of North Texas, March 2005.
- Co-organizer (with M. Baruch and R. Boltje) of the Number Theory Seminar, University of California at Santa Cruz, 1999–2002.
- Co-organizer (with M. Baruch and D. Bump) of the special session *Automorphic Forms and Representations*, AMS Sectional Meeting in San Francisco, October 2000.

### Editing, refereeing, and reviewing

- Member of the editorial board of *Journal of Analysis & Number Theory*, 2012 – present.
- Member of the editorial board of *Austin Mathematics*, 2014 – present.
- Referee for NSF grant proposals in Algebra and Number Theory, 2001 – present.
- Referee for the NSA Mathematical Sciences Grant Program, 2012 – present.
- Reviewer for Mathematical Reviews and Zentralblatt MATH, 2001 – present.

- Referee for the following research journals (7 – 10 reports per year):

<i>Abh. Math. Sem. Univ. Hamb.</i>	<i>Acta Arith.</i>	<i>Acta Math. Univ. Comenian.</i>
<i>Adv. in Appl. Math.</i>	<i>Adv. Math.</i>	<i>Algebra Colloq.</i>
<i>Arch. Math. (Basel)</i>	<i>Bull. Aust. Math. Soc.</i>	<i>Bull. Korean Math. Soc.</i>
<i>Comm. Math. Univ. Carolin.</i>	<i>Comm. Number Theory Phys.</i>	<i>Complex Var. Elliptic Equ.</i>
<i>Funct. Approx. Comm. Math.</i>	<i>Illinois. J. Math.</i>	<i>Int. J. Math. Math. Sci.</i>
<i>Int. J. Number Theory</i>	<i>Internat. Math. Res. Notices</i>	<i>J. Math. Anal. Appl.</i>
<i>J. Number Theory</i>	<i>Math. Proc. Camb. Phil. Soc.</i>	<i>Math. Res. Lett.</i>
<i>Lecture Notes in Math.</i>	<i>Proc. Amer. Math. Soc.</i>	<i>Proc. Edinb. Math. Soc. (2)</i>
<i>Proc. Roy. Soc. Edinb. Sec. A</i>	<i>Publ. Mat.</i>	<i>Ramanujan J.</i>
<i>Rama. Math. Soc. Lect. Notes</i>	<i>Res. Math. Sci.</i>	<i>Res. Number Theory</i>
<i>Results Math.</i>	<i>Rev. Mat. Complut.</i>	<i>Rocky Mountain J. Math.</i>
<i>Royal Soc. Open Science</i>	<i>Trans. Amer. Math. Soc.</i>	

#### UNT COMMITTEE WORK:

- College of Science Task Force: Spring 2017.

#### College of Science

- Faculty council: 2017–2018.

#### College of Arts and Science

- Faculty council: 2014–2017.
- Graduate curriculum committee: 2010–2013.

#### Mathematics Department

- Executive committee: 2007–2008, 2011–2013, 2014–2016, 2017–2019, and 2020–2022.
- Graduate advisor: 2017–present.
- Graduate affairs committee: 2016–present.
- Complex analysis qualifying exam committee: 2002–2008 and 2010–present (chair for 2006–2007, 2012–2013, 2016–2017, and 2018–2019).
- Outreach committee: 2014–2017 and Spring 2020.
- Colloquium committee: 2002–2008 and 2010–2014 (chair for 2007–2008 and 2010–2014).
- Strategic planning committee: 2005–2006.

#### UNT MATHEMATICS DEPARTMENT AWARDS:

- Faculty Service Award, 2014 and 2018.
- Faculty Teaching Award, 2017.
- Faculty Research Award, 2015.