Olav K. Richter — Curriculum Vitae

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

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) Theta cycles modulo p^2 (with S. Ahlgren and M. Raum).
Submitted.

(2) Eisenstein series modulo p^2 (with S. Ahlgren, M. Hanson, and M. Raum).
To appear in *Forum Mathematicum*.

(3) Imaginary quadratic fields with ℓ-torsion-free class groups and specified split primes (with O. Beckwith and M. Raum).
Int. Math. Res. Not. IMRN (2024), no. 16, 11582–11596.

(4) Congruences of Hurwitz class numbers on square classes (with O. Beckwith and M. Raum).
Adv. Math. **409** (2022), Paper No. 108663, 19pp.

(5) 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.

(6) The skew-Maass lift I: The case of harmonic Maass-Jacobi forms (with M. Raum).
Res. Math. Sci. **6** (2019), no. 2, Paper No. 22, 59 pp.

(7) Generators of Jacobi forms are Poincaré series (with H. Skogman).
Ramanujan J. **45** (2018), no. 3, 639–645.

(8) Almost holomorphic Poincaré series corresponding to products of harmonic Siegel-Maass forms (with K. Bringmann and M. Westerholt-Raum).
Res. Math. Sci. **3** (2016), Paper No. 30, 16 pp.

(9) Sturm bounds for Siegel modular forms (with M. Westerholt-Raum).
Res. Number Theory **1** (2015), Paper No. 5, 8 pp.

(10) Hermitian Jacobi forms and $U(p)$ congruences (with J. Senadheera).
Proc. Amer. Math. Soc. **143** (2015), no. 10, 4199–4210.

(11) The structure of Siegel modular forms mod p and $U(p)$ congruences (with M. Raum).
Math. Res. Lett. **22** (2015), no. 3, 899–928.

(12) 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.

(13) 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.

(14) Kohnen's limit process for real-analytic Siegel modular forms (with K. Bringmann and M. Raum).
Adv. Math. **231** (2012), no. 2, 1100–1118.

(15) 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.

(16) Exact formulas for Fourier coefficients of Jacobi forms (with K. Bringmann).
Int. J. Number Theory **7** (2011), no. 3, 825–833.

(17) Congruences for Siegel modular forms (with D. Choi and Y. Choie).
Ann. Inst. Fourier (Grenoble) **61** (2011), no. 4, 1455–1466.

(18) Ramanujan congruences for Siegel modular forms (with M. Dewar).
Int. J. Number Theory **6** (2010), no. 7, 1677–1687.

(19) Zagier-type dualities and lifting maps for harmonic Maass-Jacobi forms (with K. Bringmann).
Adv. Math. **225** (2010), no. 4, 2298–2315.

(20) Differential operators and Siegel-Maass forms (with Ö. Imamoglu).
Automorphic forms, automorphic representations and related topics, 109-115, RIMS Kôkyûroku **1715**, Kyoto (2010).

(21) On congruences of Jacobi forms.
Proc. Amer. Math. Soc. **136** (2008), no. 8, 2729–2734.

(22) The action of the heat operator on Jacobi forms.
Proc. Amer. Math. Soc. **137** (2009), no. 3, 869–875.

(23) A combinatorial characterization of Jacobi forms (with Y. Choie).
Rocky Mountain J. Math. **39** (2009), no. 2, 455–462.

(24) Maass-Jacobi forms over complex quadratic fields (with K. Bringmann and C. Conley).
Math. Res. Lett. **14** (2007), no. 1, 137–156.

(25) Classification of the space spanned by theta series and applications (with Y. Choie).
Proc. Amer. Math. Soc. **135** (2007), no. 8, 2309–2315.

(26) Differential operators on Hilbert modular forms (with Y. Choie and H. Kim).
J. Number Theory **122** (2007), no. 1, 25–36.

(27) On Rankin-Cohen brackets for Siegel modular forms (with Ö. Imamoglu).
Proc. Amer. Math. Soc. **134** (2006), no. 4, 995–1001.

(28) Jacobi theta functions over number fields (with H. Skogman).
Monatsh. Math. **141** (2004), no. 3, 219–235.

(29) On transformation laws for theta functions.
Rocky Mountain J. Math. **34** (2004), no.4, 1473–1481.

(30) Theta functions with harmonic coefficients over number fields.
J. Number Theory **95** (2002), no. 1, 101–121.

(31) A remark on the behavior of theta series of degree n under modular transformations.
Int. Math. Res. Not. IMRN (2001), no. 7, 371–379.

(32) Theta functions of quadratic forms over imaginary quadratic fields.
Acta Arith. **92** (2000), no. 1, 1–9.

(33) Theta functions of indefinite quadratic forms over real number fields.
Proc. Amer. Math. Soc. **128** (2000), no. 3, 701–708.

GRANTS:

Simons Foundation

- Simons Collaboration Grant #835652
  Title: *Lifts and congruences of automorphic forms.*
  Funding dates: 9/1/2021–8/31/2026.
  Funds awarded: $42,000$.

- Simons Collaboration Grant #412655
  Title: *Real-analytic automorphic forms and applications.*
  Funding dates: 9/1/2016–8/31/2022.
  Funds awarded: $35,000$.

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

National Science Foundation

- NSF grant DMS 2442586 (PI L. Beneish; co-PI's A. Bertoloni Meli, D. Kundu and O. Richter) to support the 37th *Annual Workshop on Automorphic Forms and Related Topics*, University of North Texas, April-May 2025.
  Funds awarded: $33,800$.
  Additional support from the University of North Texas: $25,000$.
  Additional support from the Number Theory Foundation: $7,500$.
  Additional support from the Journal of Number Theory: $3,500$.
  Additional support from the Clay Mathematics Institute: $2,000$.

- NSF grant DMS 2347096 (PI L. Beneish; co-PI's O. Richter and A. Shepler) to support the 13th meeting of the conference series *Texas-Oklahoma Representations and Automorphic forms (TORA)*, University of North Texas, April 2024.
  Funds awarded: $20,000$.
  Additional support from the University of North Texas: $12,000$.
  Additional support from the Number Theory Foundation: $2,000$.
  Additional support from the Journal of Number Theory: $2,000$.

- NSF grant DMS 1855261 (co-PI's C. Drescher and A. Shepler) to support the 10th 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 31st *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 7th 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$^{\text{th}}$ 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: 1st 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$^{\text{st}}$ 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 19th *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 31st *Annual Workshop on Automorphic Forms and Related Topics*, East Tennessee State University, March 2017.
  Funds awarded: $13,980$.

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:

- Advised master's project student Jacob Williams (graduated from UNT in Spring 2024).
  Title of project: *Ramanujan congruences for the partition function.*

- Advised master's project student Lilith Harbin (graduated from UNT in Spring 2022).
  Title of project: *Modular forms and Rankin's method.*

- Advised 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

- Southwest Local Algebra Meeting, University of North Texas, March 2023.
- University of North Texas, Algebra Seminar, September 2021.
- 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 National Meeting, special session on Current Directions on Modular Forms: in Twenty Minutes Snippets, Seattle, January 2025.

- Annual Clifford Lectures: The Web of Modularity, Tulane University, February 2024.

- Annual Workshop on Automorphic Forms and Related Topics, LSU, May 2023.

- 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, Feb 2023.

- Chalmers University (Sweden), Algebraic Geometry & Number Theory Seminar, May 2019.

- Building Bridges: 2nd 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, L. Beneish, M. Emory, M. Fox, K. Martin, A. Pitale, R. Schmidt, and A. Shepler) of the conference series *Texas-Oklahoma Representations and Automorphic forms (TORA)*:

  Co-organizer (with L. Beneish, E. Pierce, and A. Shepler) of TORA XIII, UNT, April 2024.

  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 L. Beneish, A. Bertoloni Meli, and D. Kundu) of the 37th *Annual Workshop on Automorphic Forms and Related Topics*, University of North Texas, April-May 2025.

- 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 31st *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: 1st 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 19th *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.

Refeering and reviewing

- Referee for NSF grant proposals in Algebra and Number Theory, 2001 – present.

- Referee for the NSA Mathematical Sciences Grant Program, 2012 – 2014.

- Reviewer for Mathematical Reviews and Zentralblatt MATH, 2001 – present.

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

Abh. Math. Sem. Univ. Hamb.	*Acta Arith.*	*Acta Math. Univ. Comenian.*
Adv. in Appl. Math.	*Adv. Math.*	*Algebra Colloq.*
Arch. Math. (Basel)	*Bull. Aust. Math. Soc.*	*Bull. Korean Math. Soc.*
Bull. Lond. Math. Soc.	*Comm. Math. Univ. Carolin.*	*Comm. Number Theory Phys.*
Complex Var. Elliptic Equ.	*Funct. Approx. Comm. Math.*	*Illinois. J. Math.*
Int. J. Math. Math. Sci.	*Int. J. Number Theory*	*Int. Math. Res. Not. IMRN*
J. Math. Anal. Appl.	*J. Number Theory*	*Lecture Notes in Math.*
Math. Proc. Camb. Phil. Soc.	*Math. Res. Lett.*	Math. Z.
Proc. Amer. Math. Soc.	*Proc. Edinb. Math. Soc. (2)*	*Proc. Roy. Soc. Edinb. Sec. A*
Publ. Mat.	*Ramanujan J.*	*Rama. Math. Soc. Lect. Notes*
Res. Math. Sci.	*Res. Number Theory*	*Results Math.*
Rev. Mat. Complut.	*Rocky Mountain J. Math.*	*Royal Soc. Open Science*
Trans. Amer. Math. Soc.		

UNT COMMITTEE WORK:

- UNT Graduate Council: 2023–2026.
- 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
- Tenure-System Faculty Affairs Committee (formerly Executive Committee): 2007–2008, 2011–2013, 2014–2016, 2017–2019, 2020–2022, and 2023–2025.
- Graduate Admissions Director: 2024–present.
- Graduate Advisor: 2017–2022.
- Graduate Affairs Committee: 2016–present.
- Complex Analysis Qualifying Exam Committee: 2002–2008 and 2010–present (chair for 2006–2007, 2012–2013, 2016–2017, 2018–2019, 2021–2022, Fall 2022, 2023–24, 2024–2025, Fall 2025).
- 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.