

# Curriculum Vitae

Ben Kane

**Citizenship:** USA

**Date of Birth:** November 30, 1979

**Place of Birth:** Pittsburgh, Pennsylvania

## **Contact Information:**

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## **Education:**

- Ph.D., Pure Mathematics, University of Wisconsin - Madison. Thesis Title: Computationally Feasible Bounds for CM lifts of Supersingular Elliptic Curves, May 2007.
- M.S., Pure Mathematics, Carnegie Mellon University, May 2002.
- B.S., Pure Mathematics, Carnegie Mellon University, May 2002.
- B.S., Computer Science, Carnegie Mellon University, May 2002.

## **Professional Positions:**

- 2019 - current Associate Professor (tenured)  
The University of Hong Kong, Hong Kong
- 2013 - 2019 Assistant Professor  
The University of Hong Kong, Hong Kong

- 7/2014                      Guest  
Max-Planck Institute für Mathematik,  
Bonn, Germany
  
- 2009 - 2013                Postdoc  
University of Cologne, Cologne, Germany  
(top 10 among German universities)
  
- 2007 - 2009                DIAMANT Postdoc  
Radboud Universiteit  
Nijmegen, Netherlands
  
- 1 - 3/2008                 Visiting Scholar  
Institute des Hautes Études Scient.,  
Bures-sur-Yvette, Paris, France

**Professional Service and Memberships:**

- March 2021–Present, Associate Editor, Research in Number Theory.
- May 2020–May 2022, Public Relations Secretary, Hong Kong Mathematical Society.
- July 2019, Co-organizer: HKU Number Theory Days 2019, HKU
- March 2019, Conference co-organizer: Automorphic Forms Workshop, Duquesne University, Pittsburgh, PA, USA
- July 2018, Co-organizer: HKU Number Theory Days 2018, HKU
- July 2017, Conference Co-Organizer, Aspects of automorphic forms and applications, University of Hong Kong
- November 2016, Lecturer, Conference school on mock theta functions and related topics, Fukuoka, Japan
- Spring 2015–present, Co-organizer/co-founder, Postgraduate Student Number Theory Seminar, University of Hong Kong.

- Nov. 2014, Co-organizer, Conference on Number Theory, University of Hong Kong
- July 2014, Organizer, Visit for Universiteit Utrecht undergraduates and mini-conference, University of Hong Kong
- Nov. 2013, Co-organizer, Conference on Number Theory, University of Hong Kong
- Feb.–Mar. 2012, *International Symposium: Modular Forms, Mock Theta Functions, and Applications*, co-organizer with Kathrin Bringmann, Cologne, Germany.
- 2006–2007, 2011–Present, Member of the American Mathematical Society.
- Fall 2010–Spring 2013, Co-organizer, Algebra and Number Theory Seminar.
- 2010, Hiring Committee for W2 Professor (Associate Professor) in Number Theory, University of Cologne, Cologne, Germany.
- June 2009, *Intercity Number Theory Seminar* Co-organizer with Wieb Bosma, Radboud Universiteit, Nijmegen, Netherlands.
- January–August 2001, *Mu Alpha Theta National Convention 2001*, Exam Writer.

**Research Interests:**

- Number Theory (Primary Classification: 11)
- Combinatorics (Secondary Classification: 5)
- In particular:
  - Automorphic and modular forms

- Mock modular forms and harmonic weak Maass forms
- Analytic number theory
- $p$ -adic modular forms
- Quadratic forms
- Computational number theory
- Partition Theory
- $q$ -hypergeometric series
- Elliptic Curves
- Quaternion Algebras

### **Publications and Submissions:**

1. *On the boundary behaviour of automorphic forms*  
(Co-Authors: Kathrin Bringmann and Winfried Kohnen), Int. J. Number Theory **2** (2006), 187–194.
2. *Sums of triangular numbers and  $t$ -core partitions*, J. Comb. Number Theory **1** (2009), 59–64.
3. *On two conjectures about mixed sums of squares and triangular numbers*, J. Comb. Number Theory **1** (2009), 75–88.
4. *On simultaneous  $s$ -cores/ $t$ -cores*  
(Co-Authors: David Aukerman and Lawrence Sze), Discrete Math. **309** (2009), 2712–2720.
5. *Representing sets with sums of triangular numbers*, Int. Math. Res. Not. **2009** (2009), 3264–3285.  
(doi:10.1093/imrn/rnp053)
6. *Representations of integers by ternary quadratic forms*, Int. J. Number Theory **6** (2010), 127–158.
7. *New identities involving sums of the tails related to real quadratic fields*,  
(Co-Author: Kathrin Bringmann),

Special issue of the Ramanujan Journal in honor of G.E. Andrews's 70th birthday, Ramanujan J. **23** (2010), 243–251.

8. *CM liftings of supersingular elliptic curves*  
J. Théor. Nombres Bordeaux **21** (2009), 635–663.
9. *On almost universal mixed sums of squares and triangular numbers*  
(Co-Author: Zhi-Wei Sun), Trans. Amer. Math. Soc. **362** (2010), 6425–6455.
10. *Multiplicative  $q$ -hypergeometric series arising from real quadratic fields*  
(Co-Author: Kathrin Bringmann), Trans. Amer. Math. Soc. **363** (2011), 2191–2209.
11. *Inequalities for differences of Dyson's rank for all odd moduli*  
(Co-Author: Kathrin Bringmann), Math. Res. Lett. **17** (2010), 927–942.
12. *Equidistribution of Heegner points and ternary quadratic forms*  
(Co-Author: Dimitar Jetchev), Math. Ann. **35** (2011), 501–532.
13. *The aliquot constant*  
(Co-Author: Wieb Bosma), Q. J. Math., **63** (2012), 309–323.
14. *Mock modular forms as  $p$ -adic modular forms*  
(Co-Authors: Kathrin Bringmann, Pavel Guerzhoy), Trans. Amer. Math. Soc. **364** (2012), 2393–2410.
15. *Faber Polynomials and Poincaré series*, Math. Res. Lett. **18** (2011), 591–611.
16. *The triangular theorem of eight and representation by quadratic polynomials*  
(Co-Author: Wieb Bosma), Proc. Amer. Math. Soc. **141** (2013), 1473–1486.
17. *Inequalities for full rank differences of 2-marked Durfee symbols*  
(Co-Author: Kathrin Bringmann), J. Combin. Theory Ser. A **119** (2012), 483–501.

18. *Duality and differential operators for harmonic Maass forms*,  
(Co-Authors: Kathrin Bringmann, Robert Rhoades), *Dev. Math.* **28**,  
Special volume in memory of Leon Ehrenpreis (2013), 85–106.
19. *Second-order cusp forms and mixed mock modular forms*,  
(Co-Author: Kathrin Bringmann), Ramanujan J., Special volume in  
honor of Ismail and Stanton **31** (2013), 147–161.
20. *Locally harmonic Maass forms and the kernel of the Shintani lift*,  
(Co-Authors: Kathrin Bringmann and Winfried Kohnen), *Int. Math.*  
*Res. Not.* **2015** (2015), 3185–3224.
21. *On a completed generating function of locally harmonic Maass forms*,  
(Co-Authors: Kathrin Bringmann and Sander Zwegers), *Compositio*  
*Math.* **150** (2014), 749–762,  
doi:10.1112/S0010437X13007719.
22. *Theta lifts and local Maass forms*,  
(Co-Authors: Kathrin Bringmann and Maryna Viazovska), *Math. Res.*  
*Lett.* **20** (2013), 213–234.
23. *Shintani lifts and fractional derivatives for harmonic weak Maass forms*,  
(Co-Authors: Kathrin Bringmann and Pavel Guerzhoy), *Adv. Math.*  
**255** (2014), 641–671.
24. *Sums of class numbers and mixed mock modular forms*,  
(Co-Author: Kathrin Bringmann), *Math. Proc. Cambridge Philos. Soc.*  
**167** (2019), 321–333.
25. *Modular local polynomials*,  
(Co-Author: Kathrin Bringmann), *Math. Res. Lett.* **23** (2016), 973–  
986.
26. *On cycle integrals of weakly holomorphic modular forms*,  
(Co-Authors: Kathrin Bringmann and Pavel Guerzhoy), *Math. Proc.*  
*Cambridge Philos. Soc.* **158** (2015), 439–449.

27. *Ramanujan and coefficients of meromorphic modular forms*,  
(Co-Author: Kathrin Bringmann), J. Math. Pures Appl. **107** (2017),  
100–122.
28. *Regularized inner products of meromorphic modular forms and higher  
Green’s functions*,  
(Co-Authors: Kathrin Bringmann and Anna-Marie von Pippich), Com-  
mun. Contemp. Math. **21** (2019), 1850029.
29. *Half-integral weight  $p$ -adic coupling of weakly holomorphic and holomor-  
phic modular forms*,  
(Co-Authors: Kathrin Bringmann and Pavel Guerzhoy), Research in  
Number Theory **1:26** (2015), 1–13.
30. *A problem of Petersson about weight 0 meromorphic modular forms*,  
(Co-Author: Kathrin Bringmann), Res. Math. Sci., **3:24** (2016), 1–31.
31. *Ramanujan-like formulas for Fourier coefficients of all meromorphic  
cusp forms*,  
(Co-Author: Kathrin Bringmann), Adv. Math. **373** (2020), 107308.
32. *Explicit congruences for mock modular forms*,  
(Co-Author: Matthias Waldherr), J. Number Theory **166** (2016), 1–18.
33. *On sign changes of cusp forms and the halting of an algorithm to con-  
struct a supersingular elliptic curve with a given endomorphism ring*  
(Co-Author: King Cheong Fung), Math. Comp. **87** (2017), 501–514.
34. *Analogues of the Ramanujan–Mordell Theorem*  
(Co-Authors: S. Cooper and D. Ye), J. Math. Anal. Appl. **446** (2017),  
568–579.
35. *Polar harmonic Maass forms and their applications*  
(Co-Author: Kathrin Bringmann), Abh. Math. Sem. Hamburg **86**  
(2016), 213–233.
36. *Almost universal sums of polygonal numbers*  
(Co-Author: Anna Haensch), Research in Number Theory **4:4** (2018),  
1–22.

37. *On the Andrews–Zagier asymptotics for partitions without sequences*  
(Co-Authors: Kathrin Bringmann, Dan Parry, and Robert Rhoades),  
Adv. Math. **309** (2017), 436–451.
38. *On divisors of modular forms*  
(Co-Authors: Kathrin Bringmann, Steffen Löbrich, Ken Ono, and Larry Rolen), Adv. Math. **329** (2018), 541–554. *Corrigendum*: DOI 10.1016/j.aim.2019
39. *Regularized inner products and weakly holomorphic Hecke eigenforms*,  
(Co-Author: Kathrin Bringmann), Journal of Physics A: Mathematical  
and Theoretical **51** (2018) 044001.
40. *Differential operators on polar harmonic Maass forms and elliptic dual-  
ity*,  
(Co-Authors: Kathrin Bringmann and Paul Jenkins), Q. J. Math. **70**  
(2019), 1181–1207, DOI: 10.1093/qmath/haz009.
41. *The Bruinier–Funke pairing and the orthogonal complement of unary  
theta functions*,  
(Co-Author: Siu Hang Man), in Bruinier, J. and Kohnen, W. (Eds.)  
L-functions and automorphic forms, Contributions in Mathematical and  
Computational Sciences **10** (2017), Springer, 139-157, DOI: 10.1007/978-  
3-319-69712-3\_8.
42. *Central L-values of elliptic curves and local polynomials*  
(Co-authors: Stephan Ehlen, Pavel Guerzhoy, and Larry Rolen), Proc.  
London Math. Soc. **120** (2020), 742–769.
43. *Universal sums of m-gonal numbers*  
(Co-author: Jingbo Liu), Int. Math. Res. Not., accepted for publica-  
tion, DOI: 10.1093/imrn/rnz003.
44. *An extension of Rohrlich’s Theorem to the j-function*  
(Co-author: Kathrin Bringmann), Forum Math. Sigma, **8** (2020), e3,  
1–33. DOI: 10.1017/fms.2019.46.
45. *Interesting identities involving weighted representations of integers as  
sums of arbitrarily many squares*



- (Co-authors: Min-Joo Jang, Winfried Kohnen, and Siu Hang Man), Proc. Natl. Acad. Sci (USA), **116**, issue 39 (2019), 19374–19379.
46. *Regular ternary polygonal forms*  
(Co-author: Zilong He), Ramanujan J., to appear.  
DOI: <https://doi.org/10.1007/s11139-020-00282-x>
  47. *Fermat’s polygonal number theorem for repeated generalized polygonal numbers*  
(Co-authors: Soumyarup Banerjee, Manav Batavia, Muratzhan Kyranbay, Dayoon Park, Sagnik Saha, Hiu Chun So, and Piyush Varyani), J. Number Theory **220** (2021), 163–181.
  48. *Class numbers and representations by ternary quadratic forms with congruence conditions*  
(Co-author: Kathrin Bringmann), Mathematics of computation **91** (2022), 295–329.
  49. *Sign changes of Fourier coefficients of cusp forms of half-integral weight over split and inert primes in quadratic number fields*  
(co-author: Zilong He), Research in Number Theory **7:10** (2021), 1–17.
  50. *Fractional partitions and conjectures of Chern–Fu–Tang and Heim–Neuhauser*  
(Co-authors: Kathrin Bringmann, Larry Rolen, and Zack Tripp), Trans. Amer. Math. Soc. B **8** (2021), 615–634.
  51. *On  $t$ -core and self-conjugate  $(2t - 1)$ -core partitions in arithmetic progressions*  
(Co-authors: Kathrin Bringmann and Joshua Males), J. Combin. Theory Ser. A **183** (2021), 105479.
  52. *Distribution of moments Hurwitz class numbers in arithmetic progressions and holomorphic projection*  
(Co-author: Sudhir Pujahari), submitted for publication.
  53. *Representations of integers as sums of four polygonal numbers and partial theta functions*  
(Co-authors: Kathrin Bringmann and Min-Joo Jang), submitted for publication.

54. *The degenerate parts of spaces of meromorphic cusp forms under a regularized inner product*  
(Co-author: Kathrin Bringmann), Adv. Math. **402** (2022), to appear.
55. *A very special case of Siegel’s mass formula and Hecke operators*  
(Co-author: Pavel Guerzhoy), submitted for publication.
56. *Finiteness theorems for universal sums of squares of almost primes*  
(Co-author: Soumyarup Banerjee), Trans. Amer. Math. Soc., to appear.
57. *Generalized L-functions for meromorphic modular forms and their relation to the Riemann zeta function*  
(Co-author Kathrin Bringmann), submitted for publication.
58. *Odd moments for the trace of Frobenius and the Sato-Tate conjecture in arithmetic progressions*  
(Co-authors: Kathrin Bringmann and Sudhir Pujahari), submitted for publication
59. *Conjectures of Sun about sums of polygonal numbers*  
(Co-author: Kathrin Bringmann), La Mathematica, accepted for publication.
60. *Universal sums of generalized heptagonal numbers*  
(Co-authors: Ramanujam Kamaraj and Ryoko Tomiyasu), submitted for publication.

**Expository papers and book chapters:**

1. B. Kane, *Regularized Petersson inner products for meromorphic modular forms*, Proceedings of RIMS (Surikaiseikikenkyusho) Kokyuroku conference “Automorphic forms, automorphic L-functions, and related topics” held at RIMS in February, 2016, (2017), 20–30.
2. K. Bringmann, B. Kane, S. Löbrich, K. Ono, and L. Rolén, *Number theoretic generalizations of the Monster denominator formula*, Journal

of Physics A: Mathematical and Theoretical **50** (2017) 473001. (topical review)

3. B. Kane, *Polar harmonic Maass forms*, Book chapter in “Encyclopedia of Srinivasa Ramanujan and His Mathematics”, to appear, 3 pages.
4. B. Kane, *The Monster denominator formula*, Book chapter in “Encyclopedia of Srinivasa Ramanujan and His Mathematics”, to appear, 4 pages.
5. A. Haensch and B. Kane, *An algebraic and analytic approach to spinor exceptional behavior in translated lattices*, in “Automorphic forms and related topics”, Conference Proceedings of the 3rd Building Bridges Workshop 11–22 July, 2016, AMS Contemporary Mathematics series **732** (2019), 85–90.

### Students/Mentoring:

- Postdoctoral mentoring, RAs
  1. Jingbo Liu (Sept. 2016–current, University of Hong Kong, Hong Kong), postdoc
  2. Sudhir Pujahari (Apr. 2018–current, University of Hong Kong, Hong Kong), postdoc
  3. Min-Joo Jang (July 2018–current, University of Hong Kong, Hong Kong), postdoc
  4. Soumyarup Banerjee (Sept. 2018–current, University of Hong Kong, Hong Kong), postdoc
  5. Andy Kar Lun Kong (June 2019–current, University of Hong Kong, Hong Kong), postdoc
  6. Dayoon Park (Starting Feb. 2020, University of Hong Kong, Hong Kong), postdoc
  7. Swati Setia (Mar. 2018–July 2018, University of Hong Kong, Hong Kong), RA
- Ph.D. students:

1. Andy Kar Lun Kong (Sept. 2014–Dec. 2017, University of Hong Kong, Hong Kong)
  2. Zilong He (Sept. 2016–current, University of Hong Kong, Hong Kong)
- Masters students:
    1. Fung King Cheong (Jan. 2015–Jan. 2017, University of Hong Kong, Hong Kong)
    - 2.
  - Summer students:
    - Utkarsh Ruhela (IIT Roorkee, India), visited HKU 05/2015–07/2015 and 12/2017.
    - Xu YuJie (HKU), SRF, Summer 2015.
    - Bon Bong (HKU), SRF, Summer 2016.
    - Archie Mehta (IIT Roorkee, India), visited HKU 05/2015–07/2016.
    - Siu Hang Man (HKU), Summer internship, Summer 2016.
    - Chung Ping Lai (HKU), Summer internship, Summer 2016.
    - Long Tin Chan (Univ. of Cambridge, England), Summer 2016.
    - Jiaqi Leng (HKU), SRF, Summer 2017.
    - Jincheng Tang (HKU), SRF, Summer 2017.
    - Tejas Ramesh (HKU), SRF, Summer 2017
    - Atin Modi (IIT Roorkee, India), visited 05/2017–07/2017.
    - Saraswati Nanoti (IIT Roorkee, India), visited 05/2017–07/2017 and 12/2017–03/2018.
    - Ekansh Jha (IIT Roorkee, India), visited 12/2017.
    - Sabir Sk (Chennai Mathematical Institute, India), visited 12/2017
    - Piyush Varyani (IIT Roorkee, India), visited 05/2018–07/2018 and 05/2019–07/2019.
    - Mohit Bhalla (IIT Roorkee, India), visited 05/2018–07/2018

- Ramanujam Kamaraj (HKU), SRF, Summer 2018
- Shuang Liang (HKU), SRF, Summer 2018
- Sang Yan (HKU), SRF, Summer 2018
- Chia-Chun Hsieh (HKU), SRF, Summer 2018
- Fu Yaoying (HKU), Undergraduate Research Assistant, Summer 2018
- Yuet Ming David Chan (HKU), Undergraduate Research Assistant, Summer 2018
- Siu Ling Lam (HKU), Undergraduate Research Assistant, Summer 2018
- Sze Wing Fong (HKU), Undergraduate Research Assistant, Summer 2018
- Chi Ho Au (HKU), Summer Internship, Summer 2018
- Wai Hung Law (HKU), Summer Internship, Summer 2018
- Rian Chakraborty (Anand International College Of Engineering, India), visited 06/2018–09/2018
- Chun Chong (Oxford University), visited 07/2018–09/2018
- Laxmikant Mishra (IIT Roorkee, India), visited 11/2018–01/2019.
- Udit Kalani (IIT Roorkee, India), visited 11/2018–01/2019.
- Manav Batavia (IIT Bombay, India), visited 05/2019–07/2019
- Muratzhan Kyranbay (Hong Kong Baptist University), visited 05/2019–07/2019.
- Sagnik Saha (IISER Thiruvananthapuram, India), visited 05/2019–07/2019.
- 
- Hiu Chun Ho (HKU), Undergraduate Research Assistant, Summer 2019.
- Junyuan Liang (HKU), Summer Internship, Summer 2019.

- Co-Advisor for Bachelor’s thesis:  
Miriam Azoulay (July 2011, University of Cologne, advisor: Kathrin Bringmann)
- Assisted Amitabha Tripathi (Indian Institute of Technology Delhi) to find master’s thesis project (in partition theory) for a student (2009, while a Postdoc at Radboud University, Nijmegen, Netherlands).
- Bachelor’s thesis / Undergraduate research:  
Zhe Lü (July 2013, University of Cologne, advisor Kathrin Bringmann).
- Co-Advisor for Masters thesis:  
Saraswati Nanoti (IIT Roorkee, India), external research advisor.
- Co-Advised Ph.D. student:  
René Olivetto (Ph. D. 2014, University of Cologne, advisor Kathrin Bringmann)
- Undergraduate Research Projects:
  - 2014–2015: Chan, Yui Him Jacky (HKU)
  - 2016–2017, Yang, Ruoxuan (HKU)

**Research Grants:**

- 2014–2017, Hong Kong RGC Grant (Early Career Scheme Project Number 27300314), Locally harmonic Maass forms and vanishing of central  $L$ -values, 755418 HKD (  $\sim$ \$97500 USD)
- 2015–2018, Hong Kong RGC Grant (General Research Fund Project Number 17302515), Signs of Fourier coefficients of cusp forms and representations by quadratic polynomials, 631972 HKD (  $\sim$ \$81500 USD)
- 2016–2019, Hong Kong RGC Grant (General Research Fund Project Number 17316416), Differential operators on polar harmonic Maass forms and  $k$ -fold differential forms, 488501 HKD (  $\sim$ \$63000 USD)

- 2017–2020, Hong Kong RGC Grant (General Research Fund Project Number 17301317), Regularized inner products and meromorphic modular forms, 708430 HKD (  $\sim$ \$90500 USD)
- 2018–2021, Hong Kong RGC Grant (General Research Fund Project Number 17303618), A family of  $L$ -functions related to the Riemann zeta function, 456452 HKD (  $\sim$ \$58175 USD)
- 2022–2025, Hong Kong RGC Grant (General Research Fund Project Number 17314122), Negative Bias conjectures for moments of normalized trace of Frobenius on one-variable families of elliptic curves and holomorphic projection on non-holomorphic modular forms, 783000 HKD (  $\sim$ \$99800 USD)

### Teaching and Grading Experience:

- Spring 2019, Lecturer, Introduction to Number Theory, University of Hong Kong, Hong Kong.
- Spring 2019, Lecturer, Mathematics: A Cultural Heritage, University of Hong Kong, Hong Kong.
- Spring 2019, Directed studies, The University of Hong Kong, Hong Kong.
- Spring 2018, Lecturer, Introduction to Number Theory, University of Hong Kong, Hong Kong.
- Spring 2018, Lecturer, Mathematics: A Cultural Heritage, University of Hong Kong, Hong Kong.
- Fall 2017, Directed studies, The University of Hong Kong, Hong Kong.
- Spring 2017, co-teacher, Senior mathematics seminar, University of Hong Kong, Hong Kong.
- Spring 2017, Lecturer, Mathematics: A Cultural Heritage, University of Hong Kong, Hong Kong.

- Fall 2016, Lecturer, Introduction to Mathematical Analysis, University of Hong Kong, Hong Kong.
- Spring 2016, Lecturer, Mathematics: A Cultural Heritage, University of Hong Kong, Hong Kong.
- Fall 2015, Lecturer, Introduction to Mathematical Analysis, University of Hong Kong, Hong Kong.
- Spring 2015, Lecturer, Mathematics: A Cultural Heritage, University of Hong Kong, Hong Kong.
- Fall 2014, Lecturer, Introduction to Mathematical Analysis, University of Hong Kong, Hong Kong.
- Spring 2014, Lecturer, University Mathematics II, University of Hong Kong, Hong Kong.
- Spring 2013, Assistant, Seminar on Mock theta functions, University of Cologne, Cologne, Germany.
- Fall 2013, Assistant, Seminar on Elliptic functions, University of Cologne, Cologne, Germany.
- Spring 2012, Lecturer, Elementary Number Theory (lectures in German) and Seminar on L-Functions, University of Cologne, Cologne, Germany.
- Fall 2011, Assistant, Linear Algebra I and Seminar on Jacobi Forms, University of Cologne, Cologne, Germany.
- Spring 2011, Assistant, Complex Analysis and Seminar on Modular Forms, University of Cologne, Cologne, Germany.
- Fall 2010, Assistant, Elementary Number Theory and Seminar on Ramanujan's Lost Notebook, University of Cologne, Cologne, Germany.
- Fall 2009/Spring 2010, Assistant (includes administration for 500+ person class and homework / exam generation), Lineare Algebra I/II, University of Cologne, Cologne, Germany.



- Fall 2008, Lecturer, Random Graph Theory - Master's course, Radboud Universiteit, Nijmegen, Netherlands.
- Fall 2005, Grader, University of Wisconsin - Madison, Linear Algebra
- Fall 2004, Grader, University of Wisconsin - Madison, Graduate Algebra II
- Spring 2004, Fall 2004, Spring 2005, Teaching Assistant, University of Wisconsin - Madison , College Algebra I
- Fall 2004, Teaching Assistant, University of Wisconsin - Madison, Calculus I
- Summer 2002, Teaching Assistant, Carnegie Mellon University, Concepts of Mathematics
- Fall 2001, Grader, Carnegie Mellon University, Concepts of Mathematics
- Fall 2000, Teaching Assistant, Carnegie Mellon University, Differential Equations
- Spring 2000, Teaching Assistant, Carnegie Mellon University, Calculus I
- Fall 1999, Teaching Assistant, Carnegie Mellon University, Concepts of Mathematics

### **Presentations:**

- May 2002 *Simultaneous  $s/t$ -cores*, Thesis Defense, Carnegie Mellon University, Pittsburgh, PA.
- November 2005, *Boundary Behavior of Modular Forms*, Midwest Number Theory Conference for Graduate Students III, University of Wisconsin - Madison.
- March 2006, *Boundary Behavior of Modular Forms*, The 20th Annual Workshop on Automorphic Forms and Related Topics, University of Colorado at Boulder.

- October 2006 *Ternary Quadratic Forms and CM Lifts of Supersingular Elliptic Curves*, Midwest Number Theory Conference for Graduate Students IV, University of Illinois at Urbana-Champaign.
- April 2007, *Computationally Feasible Bounds for Quadratic Forms and CM Lifts of Supersingular Elliptic Curves*, Ph.D. Thesis Defense, University of Wisconsin - Madison.
- November 2007, *Computationally Feasible Bounds for Quadratic Forms and CM Lifts of Supersingular Elliptic Curves*, DIAMANT/EIDMA Symposium, Amersfoort, Netherlands.
- December 2007, *Computationally Feasible Bounds for Quadratic Forms and CM Lifts of Supersingular Elliptic Curves*, Invited Speaker,  $l$ -adic cohomology and number fields, Centre International de Rencontres Mathématiques (CIRM/Luminy), Marseille, France.
- January 2009, *Equidistribution of Heegner Points and Quadratic Forms*, Joint meetings of the AMS-MAA, Washington, DC, USA.
- May 2009, *Multiplicative  $q$ -hypergeometric Series and Real Quadratic UFDs*, Mock theta functions and applications in combinatorics, algebraic geometry, and mathematical physics, Bonn, Germany.
- September 2009, *Equidistribution of Heegner Points and Quadratic Forms*, Seminar Aachen–Köln–Lille–Siegen on Automorphic Forms, Siegen, Germany.
- December 2009, *Inequalities for differences of Dyson's rank for all odd moduli*, Number Theory and Mock Theta Functions: SASTRA Ramanujan Prize Conference, SASTRA University, Tamil Nadu, India.
- August 2010, *Mock modular forms as  $p$ -adic modular forms*, Durham Days on Modular forms, Durham, England.
- January 2011, *Mock modular forms as  $p$ -adic modular forms*, The number theory of partitions, Emory University, Atlanta, GA, USA.

- February 2011, *Faber polynomials and Poincaré series*, School and Conference on Modular Forms and Mock Modular Forms and their Applications in Arithmetic, Geometry and Physics, International Center for Theoretical Physics, Trieste, Italy.
- September 2011, *Locally harmonic Maass forms*, Deutsche Mathematiker-Vereinigung Jahrestagung Köln 2011 (DMV yearly meeting), Cologne, Germany.
- November 2011, *Representations by triangular, square, and pentagonal sums*, Diophantine methods, lattices, and arithmetic theory of quadratic forms, Banff International Research Station, Banff, Canada.
- February 2012, *Locally harmonic Maass forms and rational periods*, Symposium on Modular Forms, Mock Theta Functions, and Applications, Cologne, Germany.
- March 2012, *Representations by triangular, square, and pentagonal sums*, AMS Western Sectional Meeting, Honolulu, Hawaii, USA.
- March 2012, *Locally harmonic Maass forms*, Hawaii Conference in Algebraic Number Theory, Arithmetic Geometry, and Modular Forms, Honolulu, Hawaii, USA.
- August 2012, *Locally harmonic Maass forms and rational periods*, Building Bridges: 1<sup>st</sup> EU-US Conference on Automorphic Forms and Related Topics, Aachen, Germany.
- November 2012, invited to attend “Algebraic geometry, modular forms and applications to physics,” Edinburgh, Scotland.
- December 2012, *Mock modular forms as  $p$ -adic modular forms*, The Legacy of Srinivasa Ramanujan, Delhi, India.
- March 2013, *Locally harmonic Maass forms*, Automorphic Forms and L-functions, on the occasion of Winfried Kohnen’s 60th birthday, Darmstadt, Germany.
- November 2013, *Sums of class numbers and mixed mock modular forms*, Number theory conference, the University of Hong Kong.

- November 2014, *Cycle integrals of meromorphic modular forms and CM-values of automorphic forms*, Number theory conference, the University of Hong Kong.
- August 2015, *Meromorphic modular forms and polar harmonic Maass forms*, 5th East Asia Number Theory Conference, Chuncheon, Korea.
- January 2016, *Meromorphic modular forms and polar harmonic Maass forms*, Automorphic forms, automorphic  $L$ -functions, and related topics, Research Institute for Mathematical Sciences, Kyoto, Japan.
- March 2016, *Fourier coefficients of meromorphic modular forms*, One of the main talks at Number Theory in honor of Krishna Alladi's 60th birthday, University of Florida, Gainesville, Florida, USA.
- March 2016, *Inner products of meromorphic modular forms*, Number Theory in honor of Krishna Alladi's 60th birthday, University of Florida, Gainesville, Florida, USA.
- July 2016, *On sign changes of cusp forms and the halting of an algorithm to construct a supersingular elliptic curve with a given endomorphism ring*, Invited speaker, Pan Asia Number Theory Conference 2016, Academia Sinica, Taipei, Taiwan.
- June 2017, *Regularized inner products and meromorphic modular forms*, Invited speaker, International conference on special functions: theory, computation, and applications, City University of Hong Kong, Hong Kong.
- June 2017, *Regularized inner products and meromorphic modular forms*, Invited speaker, Postech-HIT International Number Theory Workshop on Arithmetics of Automorphic Forms, HIT, Harbin, China.
- June 2017, *Sign changes of Fourier coefficients of cusp forms and representations of integers by quadratic polynomials*, Invited speaker, Postech-HIT International Number Theory Workshop on Arithmetics of Automorphic Forms, HIT, Harbin, China.

- July 2017, *Regularized inner products and meromorphic modular forms*, Aspects of automorphic forms and applications, University of Hong Kong, Hong Kong.
- September 2017, *Sums of class numbers and mixed mock modular forms*, International Conference on Class Groups & related topics, Harish-Chandra Research Institute, Allahabad, India.
- December 2017, *Regularized inner products and meromorphic modular forms*, Trends in Modular forms, National Institute for the Mathematical Sciences, Daejeon, South Korea.
- March 2018, *The mathematical key to unlocking the mysteries of cryptography*, University of Hong Kong, public lecture (in Mandarin).
- April 2018, *Universal sums of polygonal numbers*, Number Theory and its connections with Random Matrices and Extreme Values, University of Hong Kong.
- October 2018, *An algebraic approach to the Siegel-Weil average for binary quadratic forms*, International conference on class groups of number fields & related topics - 2018, Harish-Chandra Research Institute, Allahabad, India.
- January 2019, *An algebraic approach to the Siegel-Weil average for binary quadratic forms*, Conference on the arithmetic theory of quadratic forms, Seoul National University, Seoul, South Korea.
- October 2019, *Ternary quadratic forms with congruence conditions and class numbers of imaginary quadratic orders*, conference-closing plenary talk, International Conference on Class Groups & related topics - 2019, Harish-Chandra Research Institute, Allahabad, India.
- October 2019, Closing plenary talk: *Ternary quadratic forms with congruence conditions and class numbers of imaginary quadratic orders*, International conference on class groups of number fields & related topics - 2019, Harish-Chandra Research Institute, Allahabad, India.

### Colloquia and Seminars:

- March 2004, *Lifting Automorphisms of Quotients by Central Cyclic Subgroups*, University of Wisconsin - Madison, Madison, Wisconsin.
- July 2005, *Lifting Automorphisms*, Invited Colloquium, California Polytechnic State University, San Luis Obispo, California.
- January 2006, *Boundary Behavior of Modular Forms*, University of Wisconsin - Madison, Madison, Wisconsin.
- June 2007 *Computationally Feasible Bounds for Quadratic Forms and CM Lifts of Supersingular Elliptic Curves*, Number Theory Seminar, Academia Sinica, Taipei, Taiwan.
- July 2007 *Computationally Feasible Bounds for Quadratic Forms and CM Lifts of Supersingular Elliptic Curves*, Number Theory Seminar, National Center for the Theoretical Sciences, National Tsing Hua University, Hsinchu, Taiwan.
- September 2007, *Simultaneous  $s$ -cores and  $t$ -cores*, Colloquium, Radboud Universiteit, Nijmegen, Netherlands.
- November 2007, *The Triangular Theorem of 8*, Invited Colloquium, Universiteit Leiden, Leiden, Netherlands.
- January 2008, *Some Effectively Computable Applications of GRH*, Number Theory Seminar, University of Paris VI - Diderot, Paris, France.
- April 2008, *Some Effectively Computable Applications of GRH*, Number Theory Seminar, University College Dublin, Dublin, Ireland.
- November 2008, *Equidistribution of Heegner Points and Quadratic Forms*, University of Cologne, Cologne, Germany.
- May 2009, *Equidistribution of Heegner Points and Quadratic Forms*, Intercity Number Theory Seminar, Eindhoven, Netherlands.
- December 2009, *Equidistribution of Heegner Points and Quadratic Forms*, Saarland University, Saarbrücken, Germany.

- April 2010, *Mock modular forms as p-adic modular forms*, Max Planck Institute of Mathematics - Bonn, Bonn, Germany.
- June 2010, *Mock modular forms as p-adic modular forms*, Number Theory Seminar, University of Heidelberg, Heidelberg, Germany.
- August 2010, *Mock modular forms as p-adic modular forms*, Number Theory Seminar, National Center for the Theoretical Sciences, National Tsing Hua University, Hsinchu, Taiwan.
- April 2011, *Equidistribution of CM points and ternary quadratic forms*, Colloquium, Iowa State University, Ames, IA, USA.
- April 2011, *Equidistribution of CM points and ternary quadratic forms*, Colloquium, California State University - San Marcos, San Marcos, CA, USA.
- December 2011, *Locally harmonic Maass forms and rational period functions*, Bonn – Cologne Number Theory and Physics Seminar, Cologne, Germany.
- February 2012, *Locally harmonic Maass forms*, Colloquium, Jacobs University, Bremen, Germany.
- March 2012, *Locally harmonic Maass forms*, Colloquium, King's College London, London, England.
- March 2012, *Locally harmonic Maass forms and rational periods*, Colloquium, California State University – Northridge, Los Angeles, CA, USA.
- October 2012, *Locally harmonic Maass forms and the Shimura lift*, Colloquium, University of Nottingham, Nottingham, England.
- October 2012, *Local Maass forms and theta lifts*, Number Theory Seminar, Max Planck Institute of Mathematics – Bonn, Bonn, Germany.
- November 2012, *Locally harmonic Maass forms*, Colloquium, Leibniz Universität Hannover, Hannover, Germany.

- November 2012, *Lokal harmonische Maassformen*, Colloquium, Universität zu Köln, Cologne, Germany.
- November 2012, *Lokal harmonische Maassformen*, Colloquium, Technische Universität Darmstadt, Darmstadt, Germany.
- December 2012, *Locally harmonic Maass forms*, Colloquium, Utrecht University, Utrecht, Netherlands.
- January 2013, *Equidistribution and its applications*, Colloquium, Singapore University of Technology and Design, Singapore.
- February 2013, *Locally harmonic Maass forms*, Colloquium, the University of Hong Kong, Hong Kong.
- March 2014, *Locally harmonic Maass forms*, Colloquium, the Hong Kong University of Science and Technology.
- October 2014, *Sums of class numbers and mixed mock modular forms*, Colloquium, Texas A&M University – Qatar.
- November 2014, *Sums of class numbers and mixed mock modular forms*, Taipei Number Theory Seminar, National Taiwan University, Taipei, Taiwan.
- November 2017, *Sign changes of Fourier coefficients of cusp forms and representations of integers by quadratic polynomials*, Colloquium, University of Hawaii, Honolulu, Hawaii, USA.
- December 2017, *Universal sums of polygonal numbers*, Seoul National University, Seoul, South Korea.
- October 2018, *An algebraic approach to the Siegel-Weil average for binary quadratic forms*, The University of Hong Kong, Hong Kong.
- November 2018, *The mathematical key to unlocking the mysteries of cryptography*, Duquesne University, Pittsburgh, PA, USA.

### Referee Work:



- Advances in Mathematics
- Compositio Mathematica
- Transactions of the American Mathematical Society
- International Mathematical Research Notices
- International Journal of Number Theory
- Journal of Number Theory
- Proceedings of the American Mathematical Society
- Journal of Combinatorics and Number Theory
- Forum Mathematicum
- Integers Journal
- Axioms
- Ramanujan Journal
- ANTS
- Journal of Mathematical Analysis and Applications

### **Professional Awards and Honors**

- 2018 Outstanding Young Researcher Award 2018, The University of Hong Kong
- 2017 Hong Kong Mathematical Society Young Scholar Award 2017
- 2013 Cooperation partner on DFG grant “Shintani lifts for weakly holomorphic modular forms” of Kathrin Bringmann
- 2011 Who’s Who in the World.
- 2007 Vilas Travel Grant to Joint Mathematics Meetings, University of Wisconsin - Madison.

- 2005-2006 NSF VIGRE Fellowship, University of Wisconsin - Madison.
- 2002-2003 NSF VIGRE Fellowship, University of Wisconsin - Madison.
- 2002, Carnegie Mellon University Math Department Senior of the Year.
- Spring 2002, Admission to Phi Kappa Phi Honor Society.
- Summer 2001, REU, California Polytechnic State University.

**Languages Spoken/Written:**

- English (native)
- German (B2 Level)
- Mandarin Chinese (spoken: intermediate level, reading: beginner/intermediate, writing: beginner)