Dr. Benjamin Robert Kane

Address: Weyertal 86, 50931 Cologne, Germany
Phone: +1-412-567-2159 (Skype) or +49-176-3545-2587 (Cell)
Email: bkane@mi.uni-koeln.de, website: http://www.mi.uni-koeln.de/~bkane
U.S. Citizen

PROFESSIONAL POSITIONS

University of Hong Kong, Hong Kong
Assistant Professor   (tenure-track)   From Sept. 2013

University of Cologne, Cologne, Germany (top 10 among German universities)
Postdoctoral Assistant   (Habilitation expected July 2014)   2009 – Present

Radboud Universiteit, Nijmegen, Netherlands
DIAMANT Postdoctoral Assistant   2007 – 2009

Institute des Hautes Études Scientifiques, Bures-sur-Yvette, Paris, France
Visiting Scholar   Jan – Mar 2008

EDUCATION

University of Wisconsin at Madison, Madison WI, USA
Ph.D. in Pure Mathematics   2002 – 2007
Thesis: Computationally Feasible Bounds for CM Lifts of Supersingular Elliptic Curves

Carnegie Mellon University, Pittsburgh PA, USA
M.S. and B.S. in Pure Mathematics   1998 – 2002
B.S. in Computer Science
Graduated with University Honors
GPA: 3.82/4.00

TEACHING EXPERIENCE

Served as both lecturer (English and German) and teaching assistant
Administrated and graded 500+ person classes
Generated homework and exam problems
Supervised graduate thesis projects and undergraduate research
Courses

- Elementary Number Theory (lecturer – in German)   Spring 2012
- Linear Algebra I/II   Fall 2011, Spring 2010, Fall 2009
- Complex Analysis   Spring 2011
- Elementary Number Theory   Fall 2010
- Random Graph Theory – Master's Course (lecturer)   Fall 2008
- College Algebra I   Spring 2004, Fall 2004, Spring 2005

(Complete list in Appendix)

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, partition theory
- Quadratic forms, computational number theory, q-hypergeometric series

PROFFESSIONAL SERVICE AND MEMBERSHIPS

2012	Co-organizer with Kathrin Bringmann of the *International Symposium: Modular Forms, Mock Theta Functions and Applications*, Cologne, Germany
2010 – Present	Co-organizer, Algebra and Number Theory Seminar, University of Cologne
2010	Hiring Committee for W2 Professor in Number Theory, University of Cologne
2009	Co-organizer with Wieb Bosma of *Intercity Number Theory Seminar* on June 12, Nijmegen, Netherlands
2001	Exam Writer of the *Mu Alpha Theta National Convention*
Present	Member of the American Mathematical Society

Refereed journals
- *Advances in Mathematics*
- *International Mathematical Research Notices*
- *Transactions of the American Mathematical Society*
- *International Journal of Number Theory, Journal of Number Theory*
- *Proceeding of the American Mathematical Society*
- *Journal of Combinatorics and Number Theory*
- *Integers Journal, Axioms, Ramanujan Journal, Forum Mathematicum*

AWARDS AND HONORS

2013	Cooperation Partner on DFG grant of Kathrin Bringmann
2007	Vilas Travel Grant to Joint Mathematics Meetings, University of Wisconsin
2002, 2005	NSF VIGRE Fellowship, University of Wisconsin
2002	Senior of the Year, Math Department, Carnegie Mellon University
2002	Phi Kappa Phi Honor Society
2001	REU, California Polytechnic State University

LANGUAGE SKILLS

English, native language
German, B2 Level, spoken and written
Mandarin Chinese, Intermediate, spoken and written

SELECTED PUBLICATIONS

- ñ D. Jetchev and B. Kane, *Equidistribution of Heegner points and ternary quadratic forms*, Math. Ann. **35** (2011), 501–532.
- ñ B. Kane, *Representing sets with sums of triangular numbers*, Int. Math. Res. Not. **2009** (2009), 3264–3285. (doi:10.1093/imrn/rnp053)
- ñ K. Bringmann and B. Kane, *Multiplicative q-hypergeometric series arising from real quadratic fields*, Trans. Amer. Math. Soc. **363** (2011), 2191–2209.

(20 accepted, 3 submitted, 5 under preparation: Complete list in Appendix)

REFERENCES

Available Upon Request

APPENDIX (CV: Benjamin Robert Kane)

TEACHING EXPERIENCE

• Spring 2013, Assistant, Seminar on Mock theta functions, University of Cologne, Cologne, Germany.

• Fall 2012, Assistant, Seminar on Elliptic functions, University of Cologne, Cologne, Germany.

• Spring 2012, Lecturer (in German), Elementary Number Theory, 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 Linear Algebra I/II
(includes administration for 500+ person class and homework / exam generation),
University of Cologne, Cologne, Germany.

• Fall 2008, Lecturer, Random Graph Theory - Master's course,
Radboud Universiteit, Nijmegen, Netherlands.

• Fall 2005, Grader, Linear Algebra, University of Wisconsin – Madison.

• Fall 2004, Grader, Graduate Algebra II, University of Wisconsin – Madison.

• Spring 2004, Fall 2004, Spring 2005, Teaching Assistant (own lecture), College Algebra I,
University of Wisconsin – Madison.

• Fall 2004, Teaching Assistant, Calculus I, University of Wisconsin – Madison.

• Summer 2002, Teaching Assistant, Concepts of Mathematics, Carnegie Mellon University.

• Fall 2001, Grader, Concepts of Mathematics, Carnegie Mellon University.

• Fall 2000, Teaching Assistant, Differential Equations, Carnegie Mellon University.

• Spring 2000, Teaching Assistant, Calculus I, Carnegie Mellon University.

• Fall 1999, Teaching Assistant, Concepts of Mathematics, Carnegie Mellon University.

ADVISING AND CO-ADVISING

- Co-advised Bachelor Theses:
  - Miriam Azoulay (July 2011 – Advisor: Kathrin Bringmann)
  - Zhe Lü (Expected 2013 – Advisor: Kathrin Bringmann)
  - Assisted Amitabha Tripathi (Indian Inst. of Tech. Delhi) to find student's thesis topic.
- Co-advised Ph.D. Students:
  - René Olivetto (current – Advisor: Kathrin Bringmann)

PUBLICATIONS AND SUBMISSIONS

1. K. Bringmann, B. Kane, and W. Kohnen, *On the boundary behaviour of automorphic forms*, Int. J. Number Theory **2** (2006), 187–194.

2. B. Kane, *Sums of triangular numbers and t-core partitions*, J. Comb. Number Theory **1** (2009), 59–64.

3. B. Kane, *On two conjectures about mixed sums of squares and triangular numbers*, J. Comb. Number Theory **1** (2009), 75–88.

4. D. Aukerman, B. Kane, and L. Sze, *On simultaneous s-cores/t-cores*, Discrete Math. **309** (2009), 2712–2720.

5. B. Kane, *Representing sets with sums of triangular numbers*, Int. Math. Res. Not. **2009** (2009), 3264–3285. (doi:10.1093/imrn/rnp053)

6. B. Kane, *Representations of integers by ternary quadratic forms,* Int. J. Number Theory **6** (2010), 127–158.

7. K. Bringmann and B. Kane, *New identities involving sums of the tails related to real quadratic fields*, Special issue of the Ramanujan J. in honor of G.E. Andrews's 70th birthday, Ramanujan J. **23** (2010), 243–251.

8. B. Kane, *CM liftings of supersingular elliptic curves,* J. Théor. Nombres Bordeaux **21** (2009), 635–663.

9. B. Kane and Z.-W. Sun, *On almost universal mixed sums of squares and triangular numbers*, Trans. Amer. Math. Soc. **362** (2010), 6425–6455.

10. K. Bringmann and B. Kane, *Inequalities for differences of Dyson's rank for all odd moduli*, Math. Res. Lett. **17** (2010), 927–942.4

11. D. Jetchev and B. Kane, *Equidistribution of Heegner points and ternary quadratic forms*, Math. Ann. **35** (2011), 501–532.

12. K. Bringmann and B. Kane, *Multiplicative q-hypergeometric series arising from real quadratic fields*, Trans. Amer. Math. Soc. **363** (2011), 2191–2209.

13. B. Kane, *Faber Polynomials and Poincaré series*, Math. Res. Lett. **18** (2011), 591–611.

14. K. Bringmann and B. Kane, *Inequalities for full rank differences of 2-marked Durfee symbols*, J. Combin. Theory Ser. A **119** (2012), 483–501.

15. W. Bosma and B. Kane, *The triangular theorem of eight and a certain non-finiteness theorem*, Proc. Amer. Math. Soc. **141** (2013), 1473-1486.

16. W. Bosma and B. Kane, *The aliquot constant,* Q. J. Math. **63** (2012), 309-323, *doi:10.1093/qmath/haq050.*

17. K. Bringmann, B. Kane, and P. Guerzhoy, *Mock modular forms as p-adic modular forms*, Trans. Amer. Math. Soc. **364** (2012), 2393-2410.

18. K. Bringmann, B. Kane, and R. Rhoades, *Duality and differential operators for harmonic Maass forms,* Dev. Math. **28**, Special volume in memory of Leon Ehrenpreis (2013), 85-106.

19. K. Bringman and B. Kane, *Second-order cusp forms and mixed mock modular forms,* Ramanujan J. **31**, Special volume in honor of Ismail and Stanton (2013), 147-161.

20. K. Bringmann, B. Kane, and W. Kohnen, *Locally harmonic Maass forms and rational period functions*, submitted for publication.

21. K. Bringmann, B. Kane, and S. Zwegers, *On a completed generating function of locally harmonic Maass forms,* Compositio Math., accepted for publication.

22. K. Bringmann, B. Kane, and M. Viazovska, *Theta lifts and local Maass forms,* Math. Res. Lett., accepted for publication.

23. K. Bringmann, P. Guerzhoy, and B. Kane, *Shintani lifts and fractional derivatives for harmonic weak Maass forms,* submitted for publication.

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 AnnualWorkshop 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 and rational periods, 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: 1st EU-US Conference on Automorphic Forms and Related Topics, Aachen, Germany.
• November 2012, Locally harmonic Maass forms, 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 (upcoming), A generating function for locally harmonic Maass forms, 27th Annual workshop on automorphic forms and related topics, University College Dublin, Dublin, Ireland.
• March 2013 (upcoming), Locally harmonic Maass forms, Automorphic Forms and L-functions, on the occasion of Winfried Kohnen's 60th birthday, Darmstadt, Germany.

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.
- 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.
- February 2013, Locally harmonic Maass forms, Colloquium, the University of Hong Kong, Hong Kong.