

Vitae

Prof. Dr. Kathrin Bringmann
University of Cologne

Education:

- 2002 State examination (“Staatsexamen”) in Mathematics und Theology, University Würzburg.
- April 2003, Diploma in Mathematics with distinction (‘mit Auszeichnung’), University Würzburg,
Title of diploma thesis: *Exakte und asymptotische Formeln für verschiedene Partitionenanzahlen*;
Advisor: Prof. Dr. G. Köhler.
- Juli 2004, Dr. rer. nat. in Mathematik, University Heidelberg,
Title of the PhD thesis: *Applications of Poincaré series on Jacobi groups*;
Advisor: Prof. Dr. W. Kohlen.

Professional Positions:

- 2004-2007, Van Vleck Assistant Professor,
University Wisconsin in Madison.
- since 2006 (deferred 2007), Assistant Professor (tenure track),
University Minnesota in Minneapolis.
- since 2008, Professor (tenure),
University of Cologne.

Professional Awards and Honors:

- 2004 Scholarship of the DFG (deutsche Forschungsgemeinschaft).
- 2008 Scholarship of the Max-Planck Institute (Bonn, Germany).
- 2008-2011 NSF grant DMS-0757907 2008-2011 “Arithmetic properties of automorphic forms”
(123 000 dollar)
- NSF grant DMS-0847842 (with O. Richter) for the conference “Mock theta functions and
applications in combinatorics, algebraic geometry, and mathematical physics” (45 000 dollar)
- 2009 Alfried Krupp-prize (1 million euro)
- 2009 Sastra prize

Editorial boards:

- Proceedings of the AMS (upcoming)
- The Ramanujan Journal (upcoming)

Research interests:

Number theory in particular elliptic und Siegel modular forms, Maass forms, partitions, and Mock theta functions.

Publications:

- (1) K. Bringmann, *Asymptotic formulas for some restricted partition functions*
Ramanujan Journal **12**, 257-266 (2006).

- (2) K. Bringmann, *Lifting maps from a vector space of Jacobi cusp forms to a subspace of elliptic modular forms*
Mathematische Zeitschrift **253**, 735-752 (2006).
- (3) K. Bringmann, *Estimates of Fourier coefficients of Siegel cusp forms for subgroups and in the case of small weight*
Journal of the London Mathematical Society **73**, 31-47 (2006).
- (4) K. Bringmann and K. Ono, *Identities for traces of singular moduli*
Acta Arithmetica **119**, 317-327 (2005).
- (5) K. Bringmann, K. Ono, and J. Rouse, *Traces of singular moduli on Hilbert modular surfaces*
International Mathematics Research Notices **47**, 2891-2912 (2005).
- (6) K. Bringmann and K. Ono, *The $f(q)$ mock theta function conjecture and partition ranks*
Inventiones Mathematicae **165**, 243-266 (2006).
- (7) K. Bringmann and K. Ono, *Arithmetic properties of coefficients of half-integral weight Maass-Poincaré series*
Mathematische Annalen **337**, 591-612 (2007).
- (8) K. Bringmann and K. Ono, *An arithmetic formula for the partition function*
Proceedings of the American Mathematical Society **135**, 3507-3514 (2007).
- (9) K. Bringmann, B. Kane, and W. Kohnen, *On the boundary behavior of automorphic forms*
International Journal of Number Theory **2**, 187-194 (2006).
- (10) K. Bringmann and S. Hayashida, *A Converse Theorem for Hilbert-Jacobi forms*
Rocky Mountain Journal of Mathematics **39**, 423-435.
- (11) K. Bringmann and K. Ono, *Dyson's ranks and Maass forms*
Annals of Mathematics, accepted for publication.
- (12) K. Bringmann, *Asymptotics for rank partition functions*
Transactions of the American Mathematical Society **361**, 3483-3500 (2009).
- (13) K. Bringmann, *On congruences for Dyson's ranks*
International Journal of Number Theory
- (14) K. Bringmann, C. Conley, and O. Richter, *Maass-Jacobi forms over complex quadratic fields*
Mathematical Research Letters **14**, 137-156 (2007).
- (15) K. Bringmann and H. Swisher, *On a conjecture of Koike on identities between Thompson series and Roger-Ramanujan functions*
Proceedings of the American Mathematical Society **135**, 2317-2326 (2007).
- (16) K. Bringmann and T. Yang, *On Jacobi Poincaré series of small weight*
International Mathematics Research Notices **18** (2007).
- (17) K. Bringmann and K. Ono, *Lifting elliptic cusp forms to Maass forms with an application to partitions*
Proceedings of the National Academy of Sciences (USA) **104**, 3725-3731 (2007).
- (18) K. Bringmann and J. Lovejoy, *Rank and congruence for overpartition pairs*
International Journal of Number Theory **4**, 303-322 (2008).
- (19) K. Bringmann, K. Ono, and R. Rhoades, *Eulerian series as modular forms*
Journal of the American Mathematical Society **21**, 1085-1104 (2008).

- (20) K. Bringmann and D. Penniston, *Arithmetic properties of non-harmonic weak Maass forms*
Proceedings of the American Mathematical Society **137** (2009) 825-833.
- (21) K. Bringmann and J. Lovejoy, *Dyson's rank, overpartitions, and weak Maass forms*
International Mathematics Research Notices, 2007.
- (22) K. Bringmann, *On the explicit construction of higher deformations of partition statistics*
Duke Mathematical Journal **144**, 195-233 (2008).
- (23) K. Bringmann and J. Lovejoy, *Overpartitions and class numbers of binary quadratic forms*
Proceedings of the National Academy of Sciences (USA) **106**, 5513-5516 (2009).
- (24) K. Bringmann, F. Garvan, and K. Mahlburg, *Partition statistics and quasiharmonic Maass forms*
International Mathematics Research Notices, 2008.
- (25) K. Bringmann, J. Lovejoy, and R. Osburn, *Automorphic properties of generating functions for generalized rank moments and Durfee symbols*
International Mathematics Research Notices rnp **131** (2009).
- (26) K. Bringmann and S. Zwegers, *Rank-crank type PDE's and non-holomorphic Jacobi forms*
Mathematical Research Letters, accepted for publication.
- (27) K. Bringmann, J. Lovejoy, and R. Osburn, *Rank and crank moments for overpartitions*
Journal of Number Theory **129**, 2567-2574 (2009).
- (28) K. Bringmann, K. Ono, and A. Folsom, *q-series and weight 3/2 Maass forms*
Compositio Mathematica **145**, 541-552 (2009).
- (29) K. Bringmann and K. Mahlburg, *Inequalities between crank and rank moments*
Proceedings of the American Mathematical Society **137**, 2567-2574 (2009).
- (30) K. Bringmann and K. Ono, *Some characters of Kac and Wakimoto and nonholomorphic modular functions*
Math. Annalen **345**, pages 547-558 (2009).
- (31) K. Bringmann and B. Kane, *Multiplicative q-hypergeometric series arising from real quadratic fields*
Trans. Amer. Soc., accepted for publication.
- (32) K. Bringmann and K. Mahlburg, *An extension of the Hardy-Ramanujan circle method and applications to partitions without sequences*
American Journal of Mathematics, recommended for publication.
- (33) K. Bringmann and B. Kane, *Inequalities for differences of Dyson's rank for all odd moduli*
Mathematical Research Letters, accepted for publication.
- (34) K. Bringmann and O. Richter, *Zagier-type dualities and lifting maps for harmonic Maass-Jacobi forms*
submitted for publication.
- (35) K. Bringmann, K. Mahlburg, and R. Rhoades, *Asymptotics for rank and crank moments*
submitted for publication.
- (36) K. Bringmann, C. Conley, and O. Richter, *Jacobi forms over complex quadratic fields via the cubic Casimir operators*,
Comm. Math. Helvetici, accepted for publication.

- (37) K. Bringmann and O. Richter, *Exact formulas for coefficients of Jacobi forms* preprint.

5 Selected Publications:

- (1) K. Bringmann and K. Ono, *Dyson's ranks and Maass forms*
Annals of Mathematics, accepted for publication.
- (2) K. Bringmann and K. Ono, *The $f(q)$ mock theta function conjecture and partition ranks*
Inventiones Mathematicae **165**, 243-266 (2006).
- (3) K. Bringmann, *On the explicit construction of higher deformations of partition statistics*
Duke Mathematical Journal, **144**, 195-233 (2008).
- (4) K. Bringmann, K. Ono, and R. Rhoades, *Eulerian series as modular forms*
Journal of the American Mathematical Society **21**, 1085-1104 (2008).
- (5) K. Bringmann and J. Lovejoy, *Overpartitions and class numbers of binary quadratic forms*
Proceedings of the National Academy of Sciences (USA) **106**, 5513-5516 (2009).

Refereed Conference Proceedings:

- (1) K. Bringmann, *On Fourier coefficients of Siegel cusp forms*
Proceedings of the ELAZ conference 2004, 34-43.
- (2) K. Bringmann, *Mock theta functions, weak Maass forms, and applications*
Proceedings of the conference 'Modulformen' in Schiermonnikoog 2006.
- (3) K. Bringmann and K. Ono *Coefficients of harmonic weak Maass forms*,
Proceedings of the conference on Partitions, q-Series and Modular Forms, Gainesville 2008.
- (4) K. Bringmann and B. Kane, *New identities involving sums of the tails related to real quadratic fields*,
special issue of the Ramanujan Journal in celebration of G. Andrews' 70th birthday,
accepted for publication.

Teaching:

- Fall 2004/2005, Two lectures 'Linear algebra and differential equations',
Univ. Wisconsin/Madison.
- Spring 2005, Lectures 'Elementary matrix theory and linear algebra' and 'Elementary
number theory', Univ. Wisconsin/Madison.
- Fall 2005/2006, Lectures 'Elementary matrix theory and linear algebra' and 'Analytic
number theory' (graduate class), Univ. Wisconsin/Madison.
- Spring 2006, Lectures 'Calculus – functions of several variables' and 'Introduction to
probability and Markov chain modelling', Univ. Wisconsin/Madison.
- Fall 2006/2007, Lectures 'Calculus II' and 'Linear algebra and differential equations',
Univ. Wisconsin/Madison.
- Spring 2007, Lectures 'Business Calculus' and 'Elementary matrix theory and linear
algebra', Univ. Wisconsin/Madison.
- Fall 2007/2008, Two lectures 'Calculus I',
Univ. Minnesota/Minneapolis.

- Fall 2008/2009, Lecture ‘Elementary Number Theory’, Seminar ‘Partitions’, Univ. Cologne.
- Spring 2009, Lecture ‘Modular form’, Seminar ‘Zeta functions and real quadratic fields’, Univ. Cologne.
- Fall 2009/10, Lecture ‘Linear Algebra’, Univ. Cologne.

Advising:

Humboldt Fellows:

- Karl Mahlburg (deferred to 2010-2012)

Post-doctoral Fellows:

- Ben Kane

Current PhD students:

- Matthias Waldherr
- Bojan Frackenhohl

Former Diploma students:

- Bojan Frackenhohl

Professional Services:

- Referee for the following journals (> 10 Papers a year):
Annals of Mathematics, Inventiones Mathematicae, International Mathematics Research Notices, Mathematical Research Letters, Ramanujan Journal, Integers, Journal of Number Theory, European Journal of Combinatorics, International Journal of Number Theory, Journal of Mathematical Analysis and Applications, Acta Arithmetica, Annals of Combinatorics, Mathematische Zeitschrift, Discrete Mathematics, Advances in Mathematics, Proceedings National Academy of Sciences (USA), Compositio Mathematica, Communications in Number Theory and Physics.
- Organisator (with O. Richter and H. Stark) of the special session ‘Automorphic forms and related topics’
AMS national meeting, San Diego, Jan. 2008.
- Organisator (with R. Jones) of the number theory seminar of the Univ. Wisconsin/Madison, 2006-2007.
- Organisator of the number theory seminar of the Univ. of Cologne, 2008-present.
- Organisator of the seminar “Automorphic forms” (joint with Aachen, Lille, and Siegen), 2009-present.
- Organisator (with D. Zagier and O. Richter) of the international conference “Mock theta functions and applications in combinatorics, algebraic geometry, and mathematical physics” May 2009 at the Max Planck Institute.
- Organisator (with K. Ono and S. Zwegers) of the workshop “Mock modular forms in combinatorics and arithmetic geometry” at the American Institute of Mathematics, Palo Alto,

California, March 2010 (upcoming).

Collaborators:

- C. Conley (Univ. North Texas)
- A. Dabholkar (CNRS Paris and Tata Institute, India)
- A. Folsom (Univ. Wisconsin)
- F. Garvan (Univ. Florida)
- P. Guerzhoy (Univ. Hawaii)
- S. Hayashida (Univ. Siegen)
- B. Heim (Gutech, Oman)
- B. Kane (Univ. Cologne)
- W. Kohlen (Univ. Heidelberg)
- J. Lovejoy (Univ. Paris VII)
- K. Mahlburg (Princeton Univ.)
- J. Manschot (Univ. Paris)
- K. Ono (Univ. Wisconsin)
- R. Osburn (Univ. Coll. Dublin)
- D. Penniston (Furman Univ.)
- R. Rhoades (Stanford Univ.)
- O. Richter (Univ. North Texas)
- J. Rouse (Univ. Illinois)
- H. Swisher (Oregon State Univ.)
- T. Yang (Univ. Wisconsin)
- S. Zwegers (Univ. Coll. Dublin)

Presentations on Conferences:

- March 2002, *Asymptotische Formeln verschiedener Partitionen-Anzahlen*
ELAZ Conference, Univ. Freiburg (Germany).
- Jan. 2004, *Estimates of Fourier coefficients of Siegel cusp forms of small weight*
Workshop 'Automorphe Formen', Univ. Siegen (Germany).
- March 2004, *Estimates of Fourier coefficients of Siegel cusp forms of small weight*
18.annual workshop on automorphic forms and related topics, Univ. Santa Barbara.
- May 2004, *Estimates of Fourier coefficients of Siegel cusp forms having small weight*
ELAZ Conference, Univ. Mainz (Germany).
- Nov. 2004, *Estimates of Fourier coefficients of Siegel cusp forms*
Conference on additive number theory, Univ. Florida.
- Jan. 2005, *Lifting maps from a vector space of Jacobi cusp forms to a subspace of certain elliptic modular forms*
AMS national meeting, Atlanta.

- Feb. 2005, *Lifting maps from a vector space of Jacobi cusp forms to a subspace of elliptic modular forms*
Number theory conference for graduate students and recent PhDs, Univ. Illinois/Urbana-Champaign.
- March 2005, *Traces of singular moduli on Hilbert modular surfaces*
19. annual workshop on automorphic forms and related topics, Univ. North Texas.
- April 2005, *Traces of singular moduli on Hilbert modular surfaces*
ArithmeTexas, Texas A&M Univ.
- Oct. 2005, *Arithmetic Properties of Fourier coefficients of Maass-Poincaré series of half-integral weight*
Midwest Number Theory Day, Univ. Wisconsin/Madison.
- Dec. 2005, *Arithmetic Properties of Fourier coefficients of Maass-Poincaré series of half-integral weight*
Conference on intersection of arithmetic cycles and automorphic forms, Montréal.
- March 2006, *Freeman Dyson's 'Challenge for the future': The mock theta functions*
20. annual workshop on automorphic forms and related topics, Univ. Boulder.
- April 2006, *Freeman Dyson's 'Challenge for the future': The mock theta functions*
AMS meeting, Notre Dame.
- April 2006, *On mock theta functions and a conjecture of Andrews and Dragonette*
AMS meeting, San Francisco.
- July 2006, *Freeman Dyson's 'Challenge for the future': The mock theta functions*
ELAZ Conference, plenary speaker, Ulm (Germany).
- Sept. 2006, *Freeman Dyson's 'Challenge for the future': The mock theta functions*
Annual meeting of the DMV, Bonn (Germany).
- Oct. 2006, *Applications of mock modular forms*
Conference on modular forms, Schiermonnikoog (Netherlands).
- March 2007, *Dyson's rank, weak Maass forms, and applications*
21. annual workshop on automorphic forms and related topics, Univ. Santa Barbara.
- April 2007, *Dyson's rank, weak Maass forms, and applications*
Conference on dynamical systems and number theory, Univ. Pisa (Italy).
- May 2007, *Dyson's rank, weak Maass forms, and applications* (plenary speaker)
Conference in honor of H. Halberstam and J. Selfridge, Univ. Illinois/Urbana-Champaign.
- Oct. 2007, *Dyson's rank, weak Maass forms, and applications*
Workshop on modular forms, Oberwolfach (Germany).
- Dec. 2007, *Hypergeometric series, automorphic forms, and weak Maass forms* (plenary speaker)
Palmetto Number Theory Series 5, South Carolina.
- March 2008, *Dyson's rank, weak Maass forms, and applications*
Automorphic form workshop, Texas A & M.
- March 2008, *Marked Durfee symbols, weak Maass forms, and quasimock theta functions*
Partitions, q -series and modular form, Univ. of Florida.
- Mai 2008, *Asymptotic and exact formulas for coefficients of weak Maass forms.*
Workshop on the arithmetic of automorphic forms, Univ. of Hawai.

- December 2008, *Rank-Crank type PDEs and non-holomorphic Jacobi forms*
Partitions, q-series, and applications, Univ. of Penn-State.
- January 2009, *Rank-Crank type PDEs and non-holomorphic Jacobi forms*
AMS Special Session on Automorphic and Modular Forms in Number Theory, Washington, DC.
- March 2009, *Multiplicative q-hypergeometric series arising from real quadratic fields*
AMS special session on q-series and partitions, Univ. of Illinois at Urbana-Champaign.
- June 2009, *Zagier-type dualities and lifting maps for harmonic Maass-Jacobi forms*
Int. Conf. on the analytic theory of automorphic forms on the occasion of the 65th birthday of Bruggeman, Utrecht.
- Dec. 2009, *Mock theta functions, probability and cellular automata models*
Sastra prize conference, Kumbakonam, India.

Colloquia und seminar talks:

- Dec. 2002, *Asymptotische Formeln verschiedener Partitionenanzahlen*
Univ. Heidelberg, Germany.
- Nov. 2003, *Abschätzung von Fourier-Koeffizienten Siegelscher Spitzenformen*
Univ. Heidelberg, Germany.
- April 2004, *Lifting maps from a vector space of Jacobi cusp forms to a subspace of certain elliptic modular forms*
Max Planck Inst. in Bonn, Germany.
- May 2004, *Poincaré series for Siegel and Jacobi group*
Univ. Ghent, Belgien.
- June 2004, *Anwendungen von Poincaréreihen zur verallgemeinerten Jacobigruppe*
Univ. Aachen, Germany.
- Sept. 2004, *On Fourier coefficients of Siegel cusp forms with small weight*
Univ. Wisconsin/Madison.
- May 2005, *Traces of singular moduli on Hilbert modular surfaces*
Univ. Illinois/Urbana-Champaign.
- May 2005, *Traces of singular moduli on Hilbert modular surfaces*
Univ. UCLA.
- June 2005, *Arithmetische Eigenschaften von Koeffizienten von Maass-Poincaré-Reihen halbganzen Gewichts*
Colloquium, Univ. Siegen, Germany.
- Sept. 2005, *Arithmetic Properties of Fourier coefficients of Maass-Poincaré series of half-integral weight*
John Hopkins Univ.
- Oct. 2005, *On mock theta functions and a conjecture of Andrews and Dragonette*
Combinatorics seminar, Univ. Wisconsin/Madison.
- Oct. 2005, *On mock theta functions and a conjecture of Andrews and Dragonette*
Colloquium, Univ. North Texas.
- Dec. 2005, *Freeman Dyson's 'Challenge for the future': The mock theta functions*
Univ. Wisconsin/Madison.

- Dec. 2005, *Freeman Dyson's 'Challenge for the future': The mock theta functions*
Univ. Minnesota/Minneapolis.
- Dec. 2005, *Freeman Dyson's 'Challenge for the future': The mock theta functions*
Colloquium, Univ. Wisconsin/Madison.
- Feb. 2006, *Freeman Dyson's 'Challenge for the future': The mock theta functions*
Pohang Univ. (Korea).
- March 2006, *Arithmetic Properties of Fourier coefficients of Maass-Poincaré series*
of half-integral weight
Colloquium, Univ. Florida.
- March 2006, *Freeman Dyson's 'Challenge for the future': The mock theta functions*
Univ. Florida.
- March 2006, *Freeman Dyson's 'Challenge for the future': The mock theta functions*
Princeton Univ.
- Oct. 2006, *Freeman Dyson's 'Challenge for the future': The mock theta functions*
Colloquium, Univ. North Texas.
- Jan. 2007, *Freeman Dyson's 'Challenge for the future': The mock theta functions*
Max Planck Inst. in Bonn, Germany.
- Feb. 2007, *Freeman Dyson's 'Challenge for the future': The mock theta functions*
ETH Zürich, Switzerland.
- April 2007, *Dyson's rank, weak Maass forms, and applications*
Physic seminar, Univ. Wisconsin/Madison.
- April 2007, *Dyson's rank, weak Maass forms, and applications*
Univ. Illinois/Urbana-Champaign.
- Oct. 2007, *Hypergeometric series, automorphic forms, and mock theta functions*
Colloquium, Univ. of Minnesota/Minneapolis.
- Oct. 2007, *Hypergeometrische Reihen, automorphe Formen und schwache Maassformen*
Colloquium, Univ. Göttingen. Germany.
- Nov. 2007, *Hypergeometric series, automorphic forms, and weak Maass forms*
ETH Zürich, Switzerland.
- Feb. 2008, *Hypergeometric series, automorphic forms, and weak Maass forms*
Univ. Michigan.
- Feb. 2008, *Hypergeometric series, automorphic forms, and weak Maass forms*
Massachusetts Inst. of Technology.
- Feb. 2008, *Hypergeometric series, automorphic forms, and weak Maass forms*
Rice Univ.
- March 2008, *Asymptotic and exact formulas for weak Maass forms*
Univ. of Wisconsin at Madison.
- April 2008, *Asymptotic and exact formulas for weak Maass forms*
Max Planck Inst. in Bonn, Germany.
- April 2008, *Asymptotic and exact formulas for weak Maass forms*
Univ. College Dublin, Ireland.

- June 2008, *Asymptotische und exakte Formeln für Koeffizienten schwacher Maassformen*
Colloquium, Univ. Würzburg, Germany.
- February 2009, *Exact formulas and inequalities for coefficients of harmonic Maass forms*
Univ. Lausanne, Switzerland.
- March 2009, *Harmonic Maass-Jacobi forms*
Univ. Wisconsin at Madison.
- April 2009, *Asymptotic formulas and inequalities for harmonic Maass forms*
Colloquium, Univ. Heidelberg, Germany.
- July 2009, *Asymptotische und genaue Formeln für Koeffizienten harmonischer Maassformen*
Univ. Bayreuth.
- Nov. 2010, *Asymptotische und genaue Formeln für Koeffizienten harmonischer Maassformen*
Univ. Saarbrücken.