# Sun Kim

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## Education

- **Ph.D.**, Mathematics, **University of Illinois at Urbana-Champaign**,          May 2010.
  Thesis Advisors: Bruce Berndt and Kevin Ford

## Employment

- **University of Cologne**,
  Post-doc,                                                   October 2017- present

- **University of Illinois at Urbana-Champaign**,
  Visiting Assistant Professor,                         August 2014 - August 2017

- **Ohio State University**,
  Ross Assistant Professor,                          September 2011 - August 2014

- **Pennsylvania State University**,
  Lecturer (Research Sponsor - George E. Andrews),          August 2010 - June 2011

## Research Interests

- **Analytic Number theory and Combinatorics**

## Publications & Preprints

(1) (With G. E. Andrews, B. C. Berndt, S. H. Chen and A. Malik), *Four identities for third order mock theta functions*, submitted.

(2) (With B. C. Berndt, A. Dixit and A. Zaharescu), *Sums of squares and products of Bessel functions*, submitted.

(3) (With B. C. Berndt and A. Zaharescu), *The circle problem of Gauss and the divisor problem of Dirichlet- still unsolved*, **Amer. Math. Monthly**, to appear.

(4) *Bressoud's conjecture*, **Advances in Math.,** 325 (2018), 770–813.

(5) (With B. C. Berndt, A. Dixit and A. Zaharescu), *On a theorem of A. I. Popov on sums of squares*, **Proceedings of the AMS.**, 145 (2017), 3795–3808.

(6) *The sum of divisors function and Bessel function series*, **J. Number Thy.**, 170 (2017), 142–184.

(7) *Identities for trigonometric divisor sums*, **International J. Number Thy.**, 13, No. 4 (2017), 957-975.

(8) (With B. C. Berndt and A. Zaharescu), *Weighted divisor sums and Bessel function series V*, **J. Approximation Theory**, (special issue dedicated to Dick Askey on the occasion of his 80th birthday), 197 (2015), 101–114.

(9) (With B. C. Berndt), *Logarithmic means and double series of Bessel functions*, **International J. Number Thy.**, (special issue: In memory of Paul T. Bateman and Heini Halberstam), 11 (2015), 1535–1556.

(10) (With B. C. Berndt), *Identities for logarithmic means: A survey*, in *Advances in the Theory of Numbers: Proceedings of the Thirteenth Conference of the Canadian Number Theory Association*, A. Alaca, S. Alaca, and K. S. Williams, eds., Fields Inst. Research Math. Sci., vol. 77, 2015, pp. 1–10.

(11) (With B. C. Berndt and A. Zaharescu), *Analogues of Koshliakov's formula*, in **Ramanujan 125**, Contemp. Math. **627**, K. Alladi, F. Garvan, and A. J. Yee, editors, American Mathematical Society, Providence, RI, 2014, pp. 41–48.

(12) (With A. J. Yee), *Partitions with part difference conditions and Bressoud's conjecture*, **J. Combin. Thy. Ser. (A)**, 126 (2014), 35–69.

(13) (With B. C. Berndt and A. Zaharescu), *Diophantine approximation of the exponential function and Sondow's conjecture*, **Advances in Math.**, 248 (2013), 1298–1331.

(14) (With B. C. Berndt, M. T. Phaovibul and A. Zaharescu), *Diophantine approximation with partial sums of power series*, **Acta Arithmetica**, 161 (2013), 249–266.

(15) (With B. C. Berndt and A. Zaharescu), *Dirichlet L-functions, elliptic curves, hypergeometric functions, and rational approximation with partial sums of power series*, **Math. Research Letters**, 20 No. 3 (2013), 429–448.

(16) (With B. C. Berndt and A. Zaharescu), *Weighted divisor sums and Bessel function series III*, **J. Reine Angew. Math.**, 683 (2013), 67–96.

(17) (With B. C. Berndt), *A problem in diophantine approximation found in Ramanujan's lost notebook*, **Ramanujan J.**, 31 (2013), 83–95.

(18) (With B. C. Berndt and A. Zaharescu), *The circle and divisor problems, and double series of Bessel functions*, **Advances in Math.**, 236 (2013), 24–59.

(19) (With A. J. Yee), *Rogers-Ramanujan-Gordon Identities, generalized Göllnitz-Gordon identities and parity questions,* **J. Combin. Thy. Ser. (A)**, 120 (2013), 1038–1056.

(20) (With B. C. Berndt and A. Zaharescu), *The circle and divisor problems, and Ramanujan's contributions through Bessel function series*, **The Legacy of Srinivasa Ramanujan**: Proceedings of an International Conference in Celebration of the 125th Anniversary of Ramanujan's Birth: University of Delhi, 17–22 December 2012, B. C. Berndt and D. Prasad, eds., Ramanujan Mathematical Society, Mysore, 2013, pp. 111–127.

(21) (With B. C. Berndt and A. Zaharescu), *Weighted divisor sums and Bessel function series II*, **Advances in Math.**, 229 (2012), 2055–2097.

(22) (With B. C. Berndt and A. Zaharescu), *Weighted divisor sums and Bessel function series IV*, **Ramanujan J.**, 29 (2012), 79–102.

(23) (With B. C. Berndt and C. Gugg), *Ramanujan's elementary method in partition congruences*, in *Partitions, q-Series and Modular Forms*, K. Alladi and F. Garvan, eds., Developments in Math. 23, Springer, New York, 2012, pp. 13–22.

(24) *Exact covering systems in quadratic number fields*, **Quart. J. Math. (Oxford)**, 63 No. 2 (2012), 165–180.

(25) (With A. J. Yee), *Göllnitz-Gordon identities and parity questions*, **European J. of Combin.**, 32 (2011), 288–293.

(26) *A bijective proof of the quintuple product identity*, **International J. Number Thy.**, 6 No. 2 (2010), 247–256.

(27) *Bijective proofs of partition identities arising from modular equations*, **J. Combin. Thy. Ser. (A)**, 116 (2009), 699–712.

(28) *Covering systems in number fields*, **J. Number Thy.**, 129 (2009), 122–141.

## Awards

- Arnold O. Beckman Research Award     Sp 2009
  University of Illinois at Urbana-Champaign

- The Bateman Prize in Number Theory     2008-2009
  University of Illinois at Urbana-Champaign

- The Bateman Fellowship in Number Theory     2007-2008
  University of Illinois at Urbana-Champaign

- Fellow of the Department of Mathematics     Fall 2005, Sp 2006, Sp 2007, Sp2010
  University of Illinois at Urbana-Champaign

- Fellowship     Fall 2004 $\sim$ Sp 2006
  Korea Science and Engineering Foundation

## Invited Talks

- Combinatory Analysis 2018:
  A Conference in Honor of George Andrews' 80th Birthday     June 2018
  Penn State University

- 2017 Midwest Combinatorics Conference     May 2017
  University of Minnesota

- 2017 Joint Mathematics Meeting     Jan 2017
  (AMS Special Session on Partition Theory and Related Topics)

- International Number Theory Conference     Mar 2016
  University of Florida

- Algebra and Combinatorics Seminar     April 2015
  Tulane University

- The Palmetto Number Theory Series XXIII     Dec 2014
  University of South Carolina

- Invited Lecture in Algebra     July 2014
  Korea University

- Number Theory at Illinois –
  A Conference in Memory of the Batemans and Heini Halberstam     June 2014
  University of Illinois at Urbana-Champaign

- 2013 Joint Mathematics Meeting                    Jan 2013
  (AMS Special Session on the influence of Ramanujan on his 125th birthday)

- Number Theory Seminar                    Nov 2012
  University of Illinois at Urbana-Champaign

- 2011 Joint Mathematics Meeting                    Jan 2011
  (AMS Special Session on Continued Fractions)

- Focused week on quadratic forms and theta functions          Mar 2010
  University of Florida

- Conference in Number Theory                    June 2009
  Carleton University

- Special session on $q$-series and partitions                Mar 2009
  (Central Sectional Meeting of the AMS)
  University of Illinois at Urbana-Champaign

- Partitions, $q$-series and modular forms conference           Mar 2008
  University of Florida

- Illinois Number Theory Fest                    May 2007
  University of Illinois at Urbana-Champaign

## Seminar Talks

- Ohio State University - Number Theory Seminar

- Penn State University - Combinatorics/Partitions Seminar

- University of Illinois at Urbana-Champaign - Number Theory Seminar

## Referee

- Acta Arithmetica / Advances in Math. / Discrete Math. / International Journal of Number Theory / Journal of Combinatorial Theory, Series A / Journal of Number Theory / Legacy of Ramanujan / Ramanujan Journal / Rocky Mountain Journal of Mathematics.

# Teaching Experience

(1) University of Illinois at Urbana-Champaign

- Basic Discrete Mathematics                                    Spring 2017
  (List of Teachers Ranked as Excellent)

- Fundamental Mathematics                                        Fall 2016
  (List of Teachers Ranked as Excellent)

- Intro Differential Equations                  Spring, Su 2015, Spring 2016
  (List of Teachers Ranked as Excellent)

- Intro Differential Equations Plus                             Fall 2015
  (List of Teachers Ranked as Excellent)

- Basic Discrete Mathematics                        Fall 2014, Spring 2015

- REGS (Research Experience for Graduate Students)          Summer 2011

(2) Ohio State University

- Linear Algebra                              Spring, Fall 2013, Spring 2014

- Discrete Mathematical Structures I          Autumn 2011, Winter, Spring 2012

(3) Pennsylvania State University

- Calculus with Analytic Geometry I                  Fall 2010, Spring 2011