

# YIFAN YANG

## ACADEMIC DEGREES

- May 2000      **Ph.D. in Mathematics**, University of Illinois at Urbana-Champaign.  
Research area: Number theory.  
Thesis: Topics in analytic, combinatorial and probabilistic number theory.  
Advisor: Professor A. J. Hildebrand.
- May 1992      **B.S. in Mathematics**, National Taiwan University.

## ACADEMIC POSITIONS

- Aug. 2009—Present      **Professor**, National Chiao Tung University, Taiwan.
- Aug. 2011—July 2014      **Director**, Interdisciplinary Science Degree Program, National Chiao Tung University, Taiwan.
- Feb. 2005—July 2009      **Associate Professor**, National Chiao Tung University, Taiwan.
- Feb. 2008—May 2008      **Member**, Max-Planck Institut für Mathematik, Germany.
- Aug. 2007—Dec. 2007      **Visiting Scholar**, Queen's University, Canada.
- Aug. 2003—Jan. 2005      **Assistant Professor**, National Chiao Tung University, Taiwan.
- July 2001—July 2003      **Research Fellow**, National University of Singapore, Singapore.
- Sep. 2000—June 2001      **Postdoctoral Member**, Institute for Advanced Study, United States.

## AWARDS

- January 2014      **Outstanding Research Award**, National Science Council.
- Jan. 2009—Dec. 2012      **Honorary Center Scientist**, National Center for Theoretical Sciences, Taiwan.
- Aug. 2008      **T.-Y. Wu Award**, National Science Council, Taiwan.
- Dec. 2007      **Young Researcher Award**, Mathematical Society of the Republic of China.
- June 2006      **Academica Sinica Research Award for Junior Research Investigators**, Taiwan.
- May 2000      **Bateman Prize in number theory**, University of Illinois.
- Sep. 1998—Aug. 1999      **Dissertation Completion Fellowship**, University of Illinois.
- Sep. 1997—Aug. 1998      **Schark Fellowship and University Fellowship**, University of Illinois.
- Sep. 1996—Aug. 1997      **University Fellowship**, University of Illinois.

## PUBLICATIONS

1. Yifan Yang, *partitions into primes*, Trans. Amer. Math. Soc., 352 (2000), 2581—2600.
2. Yifan Yang, *inverse problems for partition functions*, Canad. J. Math. 53 (2001), 866—896
3. Yifan Yang, *on a multiplicative partition function*, Electron. J. Combin. 8 (2001) Research Paper 19,

14pp.

4. Yifan Yang, *on differential equations satisfied by modular forms*, Math. Z. 246 (2004), 1—19.
5. Yifan Yang, *transformation formulas for generalized Dedekind eta functions*, Bull. London Math. Soc. 36 (2004), 671—682.
6. Yifan Yang, *on integrals of Eisenstein series and derivatives of L-series*, Int. Math. Res. Not., 2004, 303—307.
7. Kok Seng Chua, Mong Lung Lang, Yifan Yang, *on Rademacher's conjecture: congruence subgroups of genus zero of the modular group*, J. Algebra 277 (2004), 408—428.
8. Ling Long and Yifan Yang, *a short proof of Milne's formulas for sums of integer squares*, Int. J. Number Theory 1 (2005) 533—551.
9. Yifan Yang, *defining equations of modular curves*, Adv. Math. 204 (2006) 481—508.
10. Hung-Jen Chiang-Hsieh and Yifan Yang, *determination of Hauptmoduls and construction of abelian extensions of quadratic number fields*, Canad. Math. Bull. 50 (2007), 334—346.
11. Noriko Yui and Yifan Yang, *differential equations satisfied by modular forms and K3 surfaces*, Illinois J. Math. 51 (2007), 667—696.
12. Yao-Han Chen, Yifan Yang, and Noriko Yui, *monodromy of Picard-Fuchs differential equations for Calabi-Yau threefolds*, J. Reine Angew. Math. 616 (2008) 167—203.
13. Yifan Yang, *Apery limits and special values of L-functions*, J. Math. Anal. Appl. 343 (2008), 492—513.
14. Yifan Yang, *on the mean square of the Riemann zeta function and the divisor problems*, Publ. Inst. Math. (Beograd), 83 (2008), 71—86.
15. Shinji Fukuhara and Yifan Yang, *period polynomials and explicit formulas for Hecke operators on  $\Gamma_0(2)$* , Math. Proc. Cambridge Philos. Soc., 146 (2009), 321—250.
16. Fang-Ting Tu and Yifan Yang, *defining equations of  $X_0(2^{2n})$* , Osaka J. Math, 46 (2009), 105—113.
17. Yifan Yang, *modular units and cuspidal divisor class groups of  $X_1(N)$* , J. Algebra, 322 (2009), 514—553.
18. Aristides Kontogeorgis and Yifan Yang, *automorphism groups of hyperelliptic modular curves*, LMS J. Comp. Math. 13 (2010), 144—163.
19. Yifan Yang and Jeng-Daw Yu, *structure of the cuspidal rational torsion subgroups of  $J_1(p^n)$* , J. London Math. Soc 82 (2010), 203—228.
20. Shinji Fukuhara and Yifan Yang, *twisted Hecke L-values and period polynomials*, J. Number Theory 130 (2010), 976—999.
21. Yifan Yang and Wadim Zudilin, *an  $Sp_4$  modularity of Picard-Fuchs differential equations for Calabi-Yau threefolds*, Contemporary Mathematics 517, 381—413.
22. Yifan Yang, *congruences of the partition function*, Int. Math. Res. Not., 2011, 3261—3288.
23. Heng Huat Chan, Ling Long, and Yifan Yang, *a cubic analogue of the Jacobsthal identity*, Amer. Math. Monthly 118:4 (2011), 316—326.
24. Heng Huat Chan, Yoshio Tanigawa, Yifan Yang, and Wadim Zudilin, *new analogues of Clausen's identities arising from the theory of modular forms*, Adv. Math 228 (2011), 1294-1314.

25. Shinji Fukuhara and Yifan Yang, *a basis for  $S_k(\Gamma_0(4))$  and representations of integers as sums of squares*, Ramanujan J. 28 (2012), 25—43.
26. Ki-Ichiro Hashimoto, Ling Long, and Yifan Yang, *Jacobsthal identity for  $Q(\sqrt{-2})$* , Forum Math. 24 (2012), 1225—1238.
27. Fang-Ting Tu and Yifan Yang, *lattice packing from quaternion algebras*, RIMS Kokyuroku Bessatsu B32 (2012), 229—237.
28. Yifan Yang, *Schwarzian differential equation and automorphic forms on Shimura curves*, Compositio Math. 149 (2013), 1—31.
29. Fang-Ting Tu and Yifan Yang, *algebraic transformations of hypergeometric functions and automorphic forms on Shimura curves*, Trans. Amer. Math. Soc. 365 (2013), 6697—6729.
30. Shinji Fukuhara and Yifan Yang, *a basis for  $S_k(\Gamma_1(4))$  and formulas for even powers of the Jacobi theta function*, Int. J. Number Theory 9 (2013), 1973—1993.
31. Yifan Yang, *modular forms of half-integral weights on  $SL(2, \mathbb{Z})$* , Nagoya Math. J. 215 (2014), 1—66.
32. Yifan Yang, *Ramanujan-type identities for Shimura curves*, Israel J. Math. 214 (2016), 699—731.
33. Yifan Yang, *special values of hypergeometric functions and periods of CM elliptic curves*, Trans. Amer. Math. Soc., to appear.
34. Jia-Wei Guo and Yifan Yang, *equations of hyperelliptic Shimura curves*, Compositio Math., to appear.
35. Takao Yamazaki and Yifan Yang, *rational torsion on the generalized Jacobian of a modular curve with cuspidal modulus*, Documenta Math., to appear.
36. Heng Huat Chan, Liuchuan Wang, and Yifan Yang, *congruences modulo 5 and 7 for 4-colored generalized Frobenius partitions*, to appear on Journal of Australian Mathematical Society.
37. Yifan Yang, *computing modular equations for Shimura curves*, preprint.

#### CONFERENCE ORGANIZED

1. *2012 NCTS Japan-Taiwan Joint Conference on Number Theory*, NCTS, Taiwan, August 27—September 7, 2012. (Co-organized with Takao Yamazaki.)
2. *2013 NCTS mini-workshop on Shimura curves*, NCTS, Taiwan, March 20, 2013.
3. *2014 NCTS conference on the impact of computation on number theory*, NCTS, Taiwan, July 30—August 3, 2014. (Co-organized with Winnie Li and John Voight.)
4. *Second Japan-Taiwan Joint Conference on Number Theory*, Tohoku University, Japan, September 1—5, 2014. (Co-organized with Takao Yamazaki.)

#### CONFERENCE TALKS/INVITED LECTURES

1. *Arithmetic progressions in random sets*, Illinois number theory conference, Urbana, Illinois, USA, May 1999.
2. *Inverse problems for partition functions*, AMS sectional meeting, Urbana, Illinois, USA, March 1999.

3. *Construction and applications of a class of modular functions*, 8<sup>th</sup> Canadian number theory meeting, Toronto, Canada, June 20—25, 2004.
4. *Differential equations satisfied by modular forms and K3 surfaces*, Mini-workshop on modular forms, Calabi-Yau varieties, and string duality, Tsuda College, Japan, June 11—12, 2005.
5. *Defining equations of modular curves*, 24<sup>th</sup> Journées arithmétiques, Marseille, France, July 4—8, 2005.
6. *Monodromy of hypergeometric differential equations*, 9<sup>th</sup> Canadian number theory meeting, Vancouver, Canada, July 9—14, 2006.
7. *Monodromy of Picard-Fuchs differential equations for Calabi-Yau threefolds*, Mini-workshop on modular forms, Calabi-Yau varieties, and string duality, Tsuda College, Japan, August 2—3, 2006.
8. *Defining equations of modular curves*, Algebraic number theory and related topics, Kyoto University, Japan, December 11—15, 2006.
9. *Monodromy and  $Sp_4$  modularity of Picard-Fuchs differential equations for Calabi-Yau threefolds*, NCTS conference on Galois representations and function field arithmetic, Hsinchu, Taiwan, May 14—17, 2007.
10. *Monodromy and  $Sp_4$  modularity of Picard-Fuchs differential equations for Calabi-Yau threefolds*, Fields workshop on arithmetic and geometry of algebraic varieties, Fields Institute, Canada, November 3—4, 2007.
11. *Cuspidal divisor class groups of  $X_1(N)$* , Annual meeting of the American Mathematical Society, San Diego, USA, January 6—9, 2008.
12. *Modular units and cuspidal divisor class groups of  $X_1(N)$* , East Asia number theory conference, Korean Advanced Institute for Science and Technology, Korea, January 21—24, 2008.
13. *Structure of the cuspidal rational torsion subgroups of  $J_1(p^n)$* , 10<sup>th</sup> Canadian number theory meeting, Waterloo, Canada, July 13—18, 2008.
14.  *$Sp_4$ -modularity of Picard-Fuchs differential equations for Calabi-Yau threefolds*, Workshop on number theory and physics at the crossroads, Tsuda College, Japan, August 4—6, 2008.
15. *Construction and applications of a class of modular functions*, Annual meeting of the Mathematical Society of the Republic of China, Hsinchu, Taiwan, December 19—21, 2008.
16. *Construction and applications of a class of modular functions*, Joint workshop on number theory between Japan and Taiwan, Waseda University, Japan, March 9—11, 2009.
17. *Congruences of the partition function*, East Asia number theory conference, Tsing Hua University, China, August 19—22, 2009.
18. *Congruences of the partition function*, Nankai number theory conference, Nankai University, China, August 24—28, 2009.
19. *Congruence of the partition function*, KMS-AMS joint meeting, Seoul, Korea, December 15—20, 2009.
20. *Monodromy of Picard-Fuchs differential equation*, Postech-NCTS Workshop on number theory, Pohang, Korea, December 19—20, 2009.

21. *Modular forms of half-integral weights on  $SL(2, \mathbb{Z})$* , Automorphic forms and related topics, NCTS, Hsinchu, Taiwan, July 7—9, 2010.
22. *Apery limits and special values of  $L$ -functions*, Tokyo Metropolitan University workshop, August 24, 2010.
23. *Jacobsthal identity for  $Q(\sqrt{-2})$* , Workshop on number theory, geometry, and physics at the crossroads, Tsuda College, Japan, August 30—31, 2010.
24. *Algebraic transformations of hypergeometric functions*, Annual meeting of the Taiwanese Mathematical Society, Taiwan, December 10—12, 2010.
25. *Cuspidal rational torsion subgroups of  $J_1(N)$* , Algebraic number theory and related topics, Kyoto University, Japan, December 6—10, 2010.
26. *Cuspidal rational torsion subgroups of  $J_1(N)$* , 5<sup>th</sup> International Congress of Chinese Mathematicians, Beijing, December 17—22, 2010.
27. *Schwarzian differential equations and automorphic forms on Shimura curves*, International conference on Galois representations, automorphic forms, and Shimura varieties, NCTS, Taiwan, June 20—23, 2011.
28. *Schwarzian differential equations and automorphic forms on Shimura curves*, NCTS, Taiwan – PMI, Korea workshop – number theory, Postech, Korea, July 24—26, 2011.
29. *Schwarzian differential equations and automorphic forms on Shimura curves*, Workshop on arithmetic geometry, Okinawa, Japan, October 10—13, 2011.
30. *Schwarzian differential equations and automorphic forms on Shimura curves*, International conference on number theory, University of Hong Kong, June 18—22, 2012.
31. *Hypergeometric functions as automorphic forms on Shimura curves*, 6<sup>th</sup> number theory conference, Northwest University, Xi'an, China, October 19—22, 2012.
32. *Equations of Shimura curves*, mini-workshop on Shimura curves, NCTS, Taiwan, March 20, 2013.
33. *Equations of Shimura curves*, conference on Diophantine problems and arithmetic dynamics, Academia Sinica, Taiwan, June 24—28, 2013.
34. *Explicit methods for Shimura curves*, 6<sup>th</sup> International Congress of Chinese Mathematicians, Taipei, Taiwan, July 14—19, 2013.
35. *Explicit methods for Shimura curves*, Pan-Asia number theory conference, Hanoi, Vietnam, July 22—26, 2013.
36. *Special values of hypergeometric functions and periods of CM elliptic curves*, conference in honor of Wen-Ching Li, Louisiana State University, April 12—15, 2014.
37. *Equations of Shimura curves*, 3<sup>rd</sup> Cross-Strait workshop in algebra, East China Normal University, Shanghai, July 8—12, 2014.
38. *Explicit methods for Shimura curves*, 2<sup>nd</sup> Japan-Taiwan joint conference on number theory, Kesenuma, Japan, September 1—5, 2014.
39. *Quaternionic loci in Siegel's modular threefold*, constructive methods in number theory, Bethe Center for Theoretical Physics, Bonn, Germany, March 3—7, 2015.

40. *Quaternionic loci in Siegel's modular threefold*, Mini-workshop on Calabi-Yau varieties: arithmetic, geometry, and physics, Tsuda College, Japan, August 5—7, 2015.
41. *Quaternionic loci in Siegel's modular threefold*, Computational aspects of algebraic geometry, automorphic forms, and number theory, Tsinghua Sanya International Mathematics Forum, August 31—September 4, 2015.
42. *Explicit methods for Shimura curves*, conference on algebraic number theory, Tsinghua Sanya International Mathematics Forum, January 18—22, 2016.
43. *Explicit methods for Shimura curves*, Shokaku Mathematical Lecture Series, Tohoku University, January 25—27, 2016.
44. *Equations of Shimura curves*, Hakodate workshop on arithmetic geometry, Hakodate, May 30—June 1, 2016.
45. *Rational torsion points on the generalised Jacobian of a modular curve with cuspidal modulus*, 3<sup>rd</sup> Japan-Taiwan joint conference on number theory, September 8—13, 2016.
46. *Explicit methods for Shimura curves*, Modular forms in string theory, Banff International Research Station, September 25—30, 2016.

#### SHORT-TERM VISITS

1. *Concordia University, Canada*, visit John McKay, summer 2005.
2. *Queen's University, Canada*, visit Noriko Yui, summer 2005.
3. *University of Illinois at Urbana-Champaign, USA*, summer 2005.
4. *Tsuda College, Japan*, visit Shinji Fukuhara, summer 2006.
5. *National University of Singapore, Singapore*, visit Heng Huat Chan, summer 2006.
6. *Tsuda College, Japan*, visit Shinji Fukuhara and Noriko Yui from July 28 to August 18, 2008.
7. *East China Normal University, China*, visit Zhiguo Liu from August 21 to September 4, 2008.
8. *Waseda University, Japan*, visit Ki-Ichiro Hashimoto from July 25 to August 16, 2009.
9. *Waseda University, Japan*, visit Ki-Ichiro Hashimoto from January 20 to February 10, 2010.
10. *Tsuda College, Japan*, visit Shinji Fukuhara and Noriko Yui from August 21 to September 4, 2010.
11. *Waseda University, Japan*, visit Ki-Ichiro Hashimoto from June 29 to July 21, 2011.
12. *Tohoku University, Japan*, visit Takao Yamazaki from November 6 to November 13, 2011.
13. *Hong Kong University of Science and Technology*, visit Maosheng Xiong from April 16 to April 22, 2012.
14. *Tsuda College, Japan*, visit Shinji Fukuhara and Noriko Yui from July 20 to August 3, 2012.
15. *Waseda University, Japan*, visit Ki-Ichiro Hashimoto from August 3 to August 13, 2012.
16. *University of Hong Kong*, visit Kai Man Tsang from April 2 to April 11, 2013.
17. *Tohoku University*, visit Takao Yamazaki from June 13 to June 23, 2013.
18. *Tsuda College, Japan*, visit Shinji Fukuhara from July 31 to August 17, 2013.
19. *American Institute of Mathematics*, SQuaRE workshop on power series expansions of modular forms on Shimura curves, from February 17 to February 21, 2014.

20. *Tohoku University*, visit Takao Yamazaki from September 7 to September 14, 2014.
21. *American Institute of Mathematics*, SQuaRE workshop on power series expansions of modular forms on Shimura curves, from June 15 to June 19, 2015.
22. *Tsuda College*, Japan, visit Shinji Fukuhara from August 5 to August 19, 2015.
23. *Tohoku University*, visit Yasuo Ohno from January 24 to January 31, 2016.

## SERVICES

1. Editorial Board, *Taiwanese Journal of Mathematics*, January 2013—present.
2. Panel, Mathematics division, National Science Council/Ministry of Science and Technology, Taiwan, January 2013—2015.
3. Reviewer for the *Mathematical Reviews* and the *Zentralblatt Math*.
4. Referee for international journals. (*Acta Mathematica Scientia*, *Bulletin of the Korean Mathematical Society*, *Bulletin of the London Mathematical Society*, *Communications in Number Theory and Physics*, *Compositio Mathematica*, *Integers*, *International Journal of Number Theory*, *Journal of Algebra*, *Journal of Number Theory*, *Journal de Théorie des Nombres de Bordeaux*, *Mathematische Nachrichten*, *Monatshefte für Mathematik*, *Publicationes Mathematicae Debrecen*, *Taiwanese Journal of Mathematics*, and several conference proceedings.)