CURRICULUM VITAE

HENRY H. KIM

I. ACADEMIC HISTORY

1. PERSONAL

A. Date and Place of Birth: Nov. 9, 1964, Cheju, KOREA
B. Citizenship: USA/Canada
C. Present Position: Professor

2. EDUCATION

Ph.D. in Mathematics, The University of Chicago, Chicago, IL, Aug., 1992
Title of Thesis: Exceptional modular form of weight 4 on an exceptional domain contained in C^{27}
Thesis Advisor: Prof. Walter L. Baily
M.S. in Mathematics, The University of Chicago, Chicago, IL, Aug., 1988
B.Sc. in Physics, Seoul National University, Seoul, KOREA, Feb., 1987

3. PROFESSIONAL EXPERIENCE

Professor, University of Toronto, 2003—present
KIAS scholar, Korea Institute for Advanced Study, 2006—present
Associate Member, Pohang Mathematical Institute, 2007--2010
Associate Professor, University of Toronto, 2001--2003
Associate Professor, Southern Illinois University, 2000--2001
Member, Institute for Advanced Study, 1999-2000
Assistant Professor, Southern Illinois University, 1995--2000
Postdoctoral Fellow, Mathematical Sciences Research Institute, Berkeley, CA, 1994--1995
Research Assistant Professor, Purdue University, West Lafayette, IN, 1992--1994
Lecturer in Mathematics, University of Chicago, Chicago, IL, 1989--1992
College Fellow, University of Chicago, 1988--1989

4. Research Grants Received

NSERC grant: 4/1/2018-3/31/2023
NSERC grant: 4/1/2013-3/31/2018
NSERC grant: 4/1/2007-3/31/2013
NSERC grant: 4/1/2002-3/31/2007
University Start-up grant: 7/1/01-6/30/02
NSF grant: 7/1/00-6/30/03
NSF grant: 7/1/97-6/30/00
NSA grant: 6/15/95-6/14/97

5. Award and Honor

AMS Centennial Fellowship, 2003-2005
Clay Mathematics Institute Prize Fellow, May 15, 2000--Aug. 15, 2000
University Fellow at the University of Chicago, 1987-1988

6. Short-term visit

Institute for Advanced Study, Jan 2010
Japan-U.S. Mathematics Institute (JAMI) visitor, Johns Hopkins University, February 2001

II. SCHOLARLY AND PROFESSIONAL WORK

A. Articles published.

1. (with T. Yamauchi and S. Wakatsuki) An equidistribution theorem for holomorphic Siegel modular forms of GSp_4 and its applications, J. Inst. Math. Jussieu (2018), 1-69
2. (with P.J. Cho) Moments of logarithmic derivatives of L-functions, J. Num. Th. 183 (2018), 40-61
3. (with Z. Wolske) Pure cubic fields with large minimal index, Acta Arith. 182 (2018), 271-277.
4. (with T. Yamauchi) A Miyawaki type lift for GSpin(2,10), Math. Z. 288 (2018), 415-437.
5. The residual spectrum of U(n,n): contribution from Borel subgroups, Bulletin of the Iranian J. Math. Soc. in honor of F. Shahidi. 2017
6. (with P.J. Cho) Extreme residues of Dedekind zeta functions, Math. Proc. of Cambridge Phil. Soc. 163 (2017), 369-380
7. (with P.J. Cho) Universality of Artin L-functions in conductor aspect, J. Math. Analysis and App. 456 (2017), 34-56.
8. (with T. Yamauchi) A uniform structure of subgroups of GL_n(F_q) and its application to a conditional construction of Artin representations of GL_n, J. of Ramanujan Math. Soc. 32 (2017), 75-99
9. (with P.J. Cho) Central limit theorem for Artin L-functions, Int. J. Num. Th. 13 (2017), 1-14.
10. (with T. Yamauchi) A conditional construction of Artin representations for real analytic Siegel cusp forms of weight (2,1), 225-260, Advances in the theory of automorphic forms and their L-functions, Contemp. Math. 664, AMS, 2016
11. (with T. Yamauchi) Cusp forms for exceptional groups of type E_7, Comp. Math. 152 (2016), 223-254.
12. (with T. Yamauchi) Ikeda type construction of cusp forms, Modular forms and automorphic representations, RIMS, 2015
13. (with P.J. Cho) n-level density of Artin L-functions, IMRN, 2015, no. 17, 7861-7883.
14. (with K.H. Lee and Y. Zhang) Weakly holomorphic modular forms and rank two hyperbolic Kac-Moody algebras, Trans. of AMS, 367 (2015), 8843-8860.
15. (with P.J. Cho) Low-lying zeros of Artin L-functions, Math. Z. 279 (2015), 669-688.
16. (with P.J. Cho) Effective prime ideal theorem and exponent of ideal class group, Quarterly J. Math. 65 (2014), 1179-1193.

17. (with K.H. Lee) Rank 2 symmetric hyperbolic Kac-Moody algebra and Hilbert modular forms, J. of Alg. 407 (2014), 81-104.
18. (with K.H. Lee) Automorphic correction of hyperbolic Kac-Moody algebras E_{10}, J. Math. Phys, 54 (2013)
19. (with P. J. Cho) Probabilistic properties of number fields, J. Number Th. (2013)
20. (with P.J. Cho) Weil's theorem on rational points over finite fields and Artin L-functions, The conference proceedings of Tata Institute (2013), 93-117
21. (with P. J. Cho) Logarithmic derivatives of Artin L-functions, Comp. Math. 149 (2013), 568-586.
22. (with K.H. Lee) Root multiplicities of hyperbolic Kac-Moody algebras and Fourier coefficients of modular forms, Ramanujan J. 32 (2013), 329-352.
23. Second moments of twisted Koecher-Maass series, Abh. Math. Sem. Univ. Hamburg, 82 (2012), 153-172
24. (with P.J. Cho) Application of the strong Artin conjecture to the class number problem, Can. J. Math. 65 (2013), 1201-1216.
25. (with P. Cho) Dihedral and cyclic extensions with large class numbers, J. de Theorie des Nombres, 24 (2012), 583-603
26. (with K.H. Lee) A family of generalized Kac-Moody algebras and deformation of modular forms, Int. J. of Number Theory, 5 (2012), 1107-1131
27. (with W. Kim) Residual spectrum of split reductive groups supported in a Borel subgroup under isogenies, Manuscripta Math. 2012
28. (with K.H. Lee) Quantum affine algebras, canonical bases, and deformation of arithmetical functions, Pac. J. Math., vol 255 (2012), 393-415
29. (with K.H. Lee) Representation theory of p-adic groups and canonical bases, Adv. in Math. 227 (2011), 945-961
30. (with W. Kim) On local L-functions and normalized intertwining operators II; quasi-split case, Clay Mathematics Proceedings, Vol 13, 2011
31. Second moments of holomorphic Hilbert modular forms and subconvexity, Acta Arith. 146 (2011), 319-333
32. (with Y. Zhang) *Divisor function for quaternion algebras and application to fourth moments of L-functions, J. Number Theory 129 (2009), 3000-3019*
33. (with M. Krishnamurthy) *Twisted exterior square lift from GU(2,2)_{E/F} to GL_6/F, J. of Ramanujan Math. Soc. 32 (2008), 1-32*
34. Langlands-Shahidi method and poles of automorphic L-functions. III. Exceptional groups. *J. Number Theory* 128 (2008), no. 2, 354-376.
35. (with L. Weng) *Volume of truncated fundamental domain,* Proceedings of AMS, 135 (2007), no. 6, 1681-1688
36. *Functoriality and number of congruences*, Acta Arith. 128 (2007), no. 3, 235--243.
37. *On symmetric powers of cusp forms on GL_2*, in The Conference on L-Functions, edited by L. Weng and M. Kaneko, 2007, 95-114
38. (with F. Shahidi) *Holomorphy of the 9th symmetric power L-functions*, IMRN (2006)
39. *A note on Fourier coefficients of cusp forms*, Forum Math. **18** (2006), 115-119
40. *On local L-functions and normalized intertwining operators*, Can. J. Math. **57** (3), 2005 535-597
41. (with M. Krishnamurthy) *Stable base change lift from unitary groups to GL_N*, IMRP **1** (2005), 1-52

42. (with M. Krishnamurthy) *Base change lift for odd unitary groups*, in Proceedings of Functional Analysis VIII (2004), 116-125
43. (with F. Shahidi) *On simplicity of poles of automorphic L-functions*, J. Ramanujan Math. Soc. **19** (2004), 1-14
44. (with J. Cogdell, I. Piatetski-Shapiro and F. Shahidi) *Functoriality for the classical groups*, Publ. Math. IHES No. **99** (2004), 163-233
45. (with K.H. Lee) *Spherical Hecke algebras of SL(2) over 2-dimensional local fields*, Amer. J. Math. **126** (2004), 1381-1399
46. *An application of exterior square functoriality of GL_4; Asai lift*, CRM Proc. Lecture Notes **36** (2004), 197-202
47. *An example of non-normal quintic automorphic induction and modularity of symmetric powers of cusp forms of icosahedral type*, Inv. Math. **156** (2004), 495-502
48. (with F. Shahidi) *On the holomorphy of certain L-functions*, in Contributions to Automorphic Forms, Geometry & Number Theory, a volume in honor of Joseph Shalika, The Johns Hopkins University Press (2004), 561-572.
49. *Functoriality for the exterior square of* GL_4 *and symmetric fourth of* GL_2, J. of AMS **16** (2003), no. 1, 139-183
50. (with P. Sarnak) *Refined estimates towards the Ramanujan and Selberg conjectures*, appendix to the above paper.
51. (with F. Shahidi) *Functorial products for* $GL_2 \times GL_3$ *and symmetric cube for* GL_2, Ann. of Math. **155** (2002), 837-893
52. (with F. Shahidi) *Cuspidality of symmetric powers with applications*, Duke Math. J. **112** (2002), 177-197
53. *Application of Langlands' functorial lift of odd orthogonal groups*, Trans. of AMS. **354** (2002), 2775-2796
54. (with F. Shahidi) *Symmetric cube for* GL_2, Cohomology of arithmetic groups, L-functions and automorphic forms *(Mumbai, 1998/1999)*, 205--213, Tata Inst. Fund. Res. Stud. Math., 15, *Tata Inst. Fund. Res., Bombay*, 2001
55. (with J. Cogdell, I.I. Piatetski-Shapiro and F. Shahidi) *Lifting from classical groups to* GL_N, Publ. Math. IHES. **93** (2001), 5-30
56. *Residual spectrum of odd-orthogonal groups*, IMRN **17** (2001), 873-906
57. *The residual spectrum of classical groups: contribution from Borel subgroups*, Pacific J. Math. **199** (2001), 417-445.
58. (with C. Jantzen) *Parametrization of the image of normalized intertwining operators*, Pacific J. Math. **199** (2001), 367-415.
59. *Langlands-Shahidi method and poles of automorphic L-functions II*, Israel J. Math. **117** (2000), 261-284.
60. (with F. Shahidi) *Holomorphy of Rankin triple L-functions and special values and root numbers for symmetric cube L-functions*, Israel J. Math. 120 (2000), 449-466.
61. (with F. Shahidi) *Functorial products for* $GL_2 \times GL_3$ *and functorial symmetric cube for* GL_2, C.R. Acad. Sci. Paris, **331** (2000), 599-604.
62. *Langlands-Shahidi method and poles of automorphic L-functions; application to exterior square L-functions*, Can. J. Math. **51** (1999), 835-849.
63. (with F. Shahidi) *Symmetric cube L-functions of* GL_2 *are entire*, Ann. of Math. **150**

(1999), 645-662.

64. *The residual spectrum of* G_2, Can. J. Math. **48, No 6** (1996), 1245-1272.
65. (with F. Shahidi) *Quadratic unipotent Arthur parameters and residual spectrum of* Sp_{2n}, Amer. J. Math. **118, No 2** (1996), 401-425.
66. *The residual spectrum of* Sp_4, Comp. Math. **99, No 2** (1995), 129-151.
67. *Selberg zeta function on an exceptional domain*, Manuscripta Math. **84** (1994), 315-326.
68. *Exceptional modular form of weight 4 on an exceptional domain contained in* C^{27}, Revista Mathematica Iberoamer. **9, No 1** (1993), 139-200.
69. *Eisenstein series on quaternion half-space of degree n*, Manuscripta Math. **77** (1993), 215-235.
70. *Eisenstein series on quaternion half-space*, Manuscripta Math. **76** (1992), 85-104.

B. Articles to appear

1. (with P.J. Cho) The average of the smallest prime in a conjugacy class, to appear in IMRN.
2. (with Z. Wolske) Number fields with large minimal index containing quadratic subfields, to appear in IJNT
3. Monogenic dihedral quartic extensions, to appear in Ramanujan Math J.

C. Articles submitted

1. (with T. Yamauchi and S. Wakatsuki) Equidistribution theorems for holomorphic Siegel modular forms of GSp_4; Hecke fields and n-level density, submitted
2. (with T. Yamauchi) Higher level cusp forms on the exceptional group of type E_7, Submitted

D. Presentations at professional meetings

Workshop on Automorphic Forms, Mock Modular Forms and String Theory, Oct. 29-Nov. 3, 2017, Banff, Canada
Mathematical Congress of the Americas, July 24-28, 2017, Montreal, Canada
Kac-Moody groups, Eisenstein series and its application to physics (Organizer), Nov. 12-20, 2015, Seoul, Korea
Modular Forms and Automorphic Representations, February 2-6, 2015, Kyoto, Japan
Advances in the Theory of Automorphic Forms and their L-Functions, October 16-26, 2013, Schrodinger Institute, Vienna, Austria
Pure and Applied Number Theory Conference, August 12-15, 2013, National Institute Mathematical Sciences, Korea
Conference on L-functions (Organizer), August 21-24, 2012, Jeju, Korea
Title of the talk: Automorphic correction of Kac-Moody algebras
Korean Mathematical Society Spring Meeting, April 28, 2012, Seoul, Korea
Title of the talk: Application of the strong Artin conjecture to the class number problem
Workshop on Automorphic Forms: Arithmetic and Geometry, Erwin Schrodinger Institute, Vienna, Austria, Feb 13-24, 2012

Title of the talk: Artin representations for real analytic Siegel cusp forms of weight (2,1)

International Colloquium on Automorphic representations and L-functions, Tata Institute, Mumbai, India, Jan 3-11, 2012

Title of the talk: Logarithmic derivatives of Artin L-functions

Workshop on Whittaker functions,Representations of Reductive p-adic Groups, Banff, Canada, June 7-11, 2010

Title of the talk: Representation theory of p-adic groups and canonical bases

Canadian Number Theory Association X meeting, Waterloo, July 13-18, 2008

Title of the talk: Second moments of twisted Koecher-Maass series and subconvexity of Hilbert cusp forms

Conference on Certain L-functions (in honor of Freydoon Shahidi), Purdue University July 30-Aug 3, 2007

Title of the talk: Title: Langlands-Shahidi method and some exercises on exceptional groups

Conference on L-functions, Kyushu, Japan, Feb. 18-23, 2006

Title of the talk: Langlands-Shahidi method and poles of automorphic L-functions

Recent Trends in Endoscopy and Representation Theory, Berlin, Germany, Oct. 17-21, 2005

Title of the talk: Functoriality of twisted exterior square

International Summer School on Analytic Number Theory, Hangzhou, China, Aug. 1-14, 2005

Title of the talk: Recent Advances in Langlands functoriality

International conference on Algebraic Geometry and Number Theory, St. Petersburg, Russia, June 17-24, 2005

Title of the talk: On simplicity of poles of automorphic L-functions

Conference on Automorphic Forms and the Trace Formula (in honor of James Arthur), Fields Institute, October 13-16, 2004

Title of the talk: Stable base change for unitary groups

Workshop on Functional Analysis, Croatia, June 15-21, 2003

Title of the talks: Automorphic L-functions via Langlands-Shahidi method, Functoriality of classical groups, Functoriality of symmetric powers

Workshop on Number Theory, Hakuba, Japan, November 5-9, 2002

Title of the talks: Automorphic L-functions via Langlands-Shahidi method Functoriality of symmetric cube and symmetric fourth

Workshop on Fonctorialité de Langlands: progrès récents, Luminy, France June 17-28, 2002

Title of the talk: Exterior square functoriality of GL(4) and applications

Canadian Number Theory Association, VII meeting, Montreal, May 19-25, 2002

Title of the talk: Applications of the functorial symmetric cube and symmetric fourth

Conference on L-functions and automorphic forms (in honor of Joseph Shalika), Johns Hopkins University, May 14-17, 2002

Title of the talk: Exterior square functoriality and applications

Workshop on Representations of Reductive p-adic Groups, Banff, Canada, Feb 21-23, 2002

Title of the talk: Applications of Langlands' functorial lift of odd-orthogonal groups

Workshop on Automorphic Forms and Representations of p-adic Groups, Banff, Canada, Nov 27-Dec 1, 2001

Title of the talk: An example of non-normal quintic automorphic Induction

Midwest workshop in Lie theory, representation theory and automorphic forms,

Ann Arbor, Michigan, May 11-13, 2001
Title of the talk: Functoriality of symmetric cube and symmetric fourth
Conference at Oberwolfach, Germany, March 5-11, 2000
Title of the talk: Langlands-Shahidi method and functoriality
AMS meeting, Kansas State University, KS, March 27-28, 1998
Title of the talk: Symmetric cube L-functions of GL(2) are entire
AMS meeting, Northeastern University, MA, Oct. 7-8, 1995
Title of the talk: Residual automorphic representations

E. Invited Lectures

KIAS, May 2018
Michigan, November 2017
KIAS, May 2016
SUNY Buffalo, Feb. 2016
KIAS, May 2015
Göttingen, August 2014
KIAS, May 2014
SUNY Buffalo, March 2014
Concordia University, December 2013
POSTECH, May 2013
Ohio State University, March 2012
POSTECH, November 2011
Iwha Women's University, May 2011
KIAS, May 2011
Fields Undergraduate Network, March 2011
University of Porto, Portugal, March 2010
University of Texas, October 2008
Korea Institute for Advanced Study, August 2008
Kyushu University, August 2007
POSTECH, June 2007
Concordia University, October 2006
KAIST, August 2006
Seoul National University, May 2006
Stanford University, March 2006
Technical University, Berlin, October 2005
Korea Institute for Advanced Study, August 2005
Boston College, October 2004
University of Nottingham, August 2004
Purdue University, April 2004
Seoul National University, March 2004
University of Chicago, February 2004
Eastern Carolina University, February 2004
Queen's University, Oct. 2002
University of Toronto, Sept. 2001
University of Michigan, Oct. 2001

Purdue University, Feb. 2001
Columbia University, Dec. 2000

F. Books published

Automorphic L-functions (with J. Cogdell and R. Murty), AMS Fields Monograph 20, 2004

III. TEACHING

A. List of courses taught

Spring 2018: MAT301 Groups and Symmetry, MAT223 Linear Algebra
Fall 2017: MAT401 Polynomial Equations and Fields
Spring 2017: MAT415 Algebraic Number Theory
Fall 2016: MAT401 Polynomials Equations and Fields
Spring 2016: MAT315 Introduction to Number Theory
Fall 2015: MAT1199 Introduction to Modular Forms
Spring 2015: MAT315 Introduction to Number Theory
Fall 2014: MAT1199 Introduction to Modular Forms
Fall 2013 and Spring 2014: MAT347, Groups, Rings and Fields
Fall 2012 and Spring 2013: MAT347, Groups, Rings and Fields
Spring 2011: MAT315S Number Theory
Fall 2010: MAT223F Linear Algebra
Fall 2009: MAT223F Linear Algebra, MAT334F Complex variables
Fall 2008: MAT1199F Introduction to Automorphic Forms and L-functions
Fall 2007: MAT1202F Introduction to the theory of L-functions
Spring 2007: Reading course with Yichao Zhang: Icosahedral Galois Representations
Fall 2006: MAT1210F Class Field Theory
Summer 2006: Minicourse on automorphic forms (at Korea Institute for Advanced Study)
Spring 2006: MAT1200S Algebraic Number Theory, MAT315S Number Theory
Fall 2005: MAT301F Groups and Symmetry
Summer 2004: Independent study with Xiaolong Cheng; Modular forms by Miyake
Spring 2004: Independent study with Alex Charis, Residual spectrum of exceptional groups
Fall 2003: Math1200F Algebraic Number Theory
Summer 2003: Independent study with Allan Langridge; Algebraic Number Theory
Spring 2003: Math1198S (at Fields Institute) Automorphic L-functions
Fall 2002: Math1110F Classification theory of semi-simple algebraic groups
Spring 2002: Math 1100Y Algebra, Math315S (Introduction to Number Theory)
Fall 2001: Math 1100Y (Algebra-graduate)
Spring 2001: Math 525 (Number Theory)
Fall 2000: Math 519 (Algebra I-graduate), Math 250 (Calculus II)
Fall 1999 and Spring 2000: leave of absence to the Institute for Advanced Study
Spring 1999: Math 525 (Number Theory)
Fall 1998: Math 250 (Calculus II), Math 251 (Calculus III)
Spring 1998: Math 520 (Algebra II (Galois Theory)-graduate)

Fall 1997: Math 150 (Calculus I), Math 221 (Linear Algebra)
Spring 1997: Math 109 (Trigonometry)
Fall 1996: Math 250 (Calculus II), Math 221 (Linear Algebra)
Spring 1996: Math 221 (Linear Algebra)
Fall 1995: Math 250 (Calculus II), Math 319 (Abstract Algebra-undergraduate)

B. Ph.D. student

Zack Wolske, University of Toronto, Ph.D. Nov. 2018
Thesis topic: Number fields with large minimal index
Peter J. Cho, University of Toronto, Ph.D. June 2012
Thesis topic: Automorphic L-functions and their Applications in Number Theory
Current position: Ulsan National Institute of Science and Technology, Ulsan, Korea
Yichao Zhang, University of Toronto, Ph.D. Nov. 2010
Thesis topic: L-functions in Number Theory
Current position: Harbin Institute of Technology, Harbin, China
J. Todd Pogge, Southern Illinois University, Carbondale, USA, Ph.D. Aug. 2001
Thesis topic: Residual automorphic representations of Sp_8

IV. PROFESSIONAL SERVICE

A. Department Committees:

Tenure Committee, 2013-2014
Undergraduate Committee, 2012-2017
Promotion Committee, Chair, 2013-2016
Merit Committee, 2006-2010
Reading Evaluation Committee, 2008-2009
Graduate Committee, Chair, 2006-2009, 2009-2010, 2014-2016
Awards Committee, 2005-2006, 2007-2008
Appointments Committee, 2002-2003, 2013-2014
Colloquium Committee, Chair, 2001-2002, 2002-2003, 2009-2010
Math Field Day Committee, 1995-2000
Math 221 Textbook Committee, Fall 1997
Hiring Committee, 1998-1999, 2000-2001
Graduate Program Committee, 2000-2001
Promotion and Tenure Committee, 2000-2001

B. Outside University

Editor-in-Chief for Canadian Journal of Mathematics, 2006--2016
Associate Editor for Canadian Journal of Mathematics, 2005--2006
(with J. Arthur, T. Haines, R. Murty, G. Pappas, and F. Shahidi) Organizer for special semester at Fields Institute, Spring 2003
(with R. Murty) Organizer for a workshop on Automorphic L-functions, May 2003
Referee for NSERC grant applications, National Security Agency grant applications

Referee for Manuscripta Mathematica, Canadian Journal of Mathematics, and Compositio Mathematica, IMRN, Acta Mathematica Sinica, Mathematical Reviews, Proceedings of the Japan Academy, Series A, Proceedings of AMS, Math. Ann