Curriculum Vitae

Manjul Bhargava

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Education

Princeton University, Ph. D. in Mathematics, 2001.

Harvard University, A. B., *summa cum laude* in Mathematics, 1996.

Present Positions

Professor of Mathematics, Princeton University, Princeton, NJ.

Long-Term Prize Fellow, Clay Mathematics Institute, Cambridge, MA.

Honors and Awards

Leonard M. and Eleanor B. Blumenthal Award for the Advancement of Research in Pure Mathematics, January 2005.

Packard Foundation Fellowship in Science and Engineering, November 2004.

The Mathematical Association of America's Merten M. Hasse Prize for Exposition, August 2003.

Named one of *Popular Science* Magazine's "Brilliant 10", November 2002.

Named first Five-Year Long-Term Prize Fellow of the Clay Mathematics Institute, 2000.

AMS–MAA–SIAM Frank and Brennie Morgan Prize for Outstanding Undergraduate Research in Mathematics, 1997.

Hertz Foundation Graduate Fellowship in Mathematics, 1996–2000.

Hoopes Prize for Excellence in Scholarly Work and Research, Harvard University, 1996.

Harvard University Salutatorian, 1996.

Elected Phi Beta Kappa, Harvard University, 1995.

Three–time recipient of the Derek Bok Award for Excellence in Teaching; nominated for Levinson Teaching Prize, Harvard University, 1993–1995.

Detur Prize for Outstanding Academic Achievement, Harvard University, 1993.

Winner of the New York State Science Talent Search, 1992.

Plainedge High School Valedictorian, 1992.

Plenary Addresses

Blumenthal Address, AMS–MAA Joint Meetings, Atlanta, Georgia, January 2005.

Shackleton Memorial Lecture, Project to Increase Mastery of Mathematics and Science, Wesleyan University, November 2004.

Beeger Lecture, Belgian and Dutch Mathematical Societies, Tilburg, Holland, April 2004.

AMS–MAA Joint Meetings, Phoenix, Arizona, January 2004.

Journées Arithmétiques, Graz, Austria, July 2003.

Explicit Methods in Number Theory, Oberwolfach, Germany, July 2003.

Hahn Lecture Series, Yale University, April 2003.

Lenstra Treurfeest, Mathematical Sciences Research Institute, Berkeley, March 2003.

Algorithmic Number Theory Symposium V, Sydney, Australia, July 2002.

Canadian Number Theory Association Meeting 7, Montreal, May 2002.

Clay Mathematics Institute Millennium Meeting, Paris, June 2000.

Annual Meeting of the MAA New Jersey Section, Edison, April 1997.

Morgan Prize Recipient Lecture, AMS–MAA Joint Meetings, San Diego, January 1997.

Invited Seminars and Colloquia

Explicit Methods in Number Theory, Banff Centre, Alberta, November 2004.

Department Colloquium, Wesleyan University, November 2004.

Clay Seminar Series, Clay Mathematics Institute, Cambridge, MA, November 2004.

Conference invité, College de France, Paris, October 2004.

MAGMA Workshop, Institut Henri Poincar e, Paris, October 2004.

L'Université Aix-Marseille, Marseille, October 2004.

Workshop on Explicit Algebraic Number Theory, Institut Henri Poincar e, Paris, October 2004.

Number Theory Seminar, Courant Institute, September 2004.

Third Duke Mathematical Journal Conference, Duke University, April 2004.

Öberseminar, Max Planck Institute, Bonn, Germany, April 2004.

Popular Lecture Series, IIT Bombay, Mumbai, March 2004.

Special Seminar Series, Tata Institute of Fundamental Research, Mumbai, February 2004.

Number Theory Seminar, Princeton University, December 2003.

Department Colloquium, Harvard University, April 2003.

Number Theory Seminar, Harvard University, March 2003.

Number Theory Seminar, Columbia University, November 2002.

Department Colloquium, University of Toronto, September 2002.

Automorphic Forms and Applications, Park City Mathematics Institute, July 2002.

Number Theory Seminar, University of California, Berkeley, May 2002.

Department Colloquium, University of California, Berkeley, May 2002.

Department Colloquium, Princeton University, May 2002.

Quebec-Vermont Number Theory Seminar, McGill University, April 2002.

Arithmetic Seminar, University of Michigan at Ann Arbor, April 2002.

Automorphic Forms Seminar, Institute for Advanced Study, February and March 2002.

Number Theory Seminar, The Ohio State University, February 2002.

Arithmetic Geometry Seminar, City University of New York, February 2002.

Number Theory Seminar, Princeton University, January 2002.

Number Theory Seminar, Harvard University, November 2001.

Robert Bumbcrot Festschrift, Hofstra University, May 2001.

Department Colloquium, University of Tennessee at Knoxville, April 2001.

Quebec-Vermont Number Theory Seminar, McGill University, March 2001.

Centre International de Rencontres Mathématiques, Marseille, June 2000.

Number Theory Seminar, Harvard University, April 2000.

Algebraic Combinatorics Seminar, Princeton University, March 1999.

MIT Combinatorics Seminar, Massachussetts Institute of Technology, April 1998.

Arizona Number Theory Seminar, University of Arizona at Tucson, March 1998.

Special Seminar on Combinatorics and Number Theory, Harvard University, April 1996.

Research Positions

Professor, Princeton University, July 2003–.

Visiting Assistant Professor, Harvard University, Spring 2003.

Visiting Mathematician, Princeton University, Fall 2001–Fall 2002.

Clay Mathematics Institute, Cambridge, 2000–.

AT&T Labs Research, Florham Park, NJ, Summer 1997.

Center for Communications Research, Princeton, Summer 1996.

Duluth Summer Research Program, Summer 1995.

National Security Agency, Summer 1994.

Teaching Positions

Professeur Invité, College de France, Fall 2004.

Professor, Princeton University, July 2003–.

Visiting Assistant Professor, Harvard University, Spring 2003.

Visiting Lecturer, USA/Canada Mathcamps, 1997–1998.

Teaching Fellow, Harvard University, 1993–1995.

Recent Service and Committee Work

Among the Principal Investigators on two Mathematics Department grant proposals to the NSF (VIGRE and Discrete Mathematics), 2004–2005.

Outside examiner of Ph.D. thesis at L'Université Aix-Marseille, October 2004.

The Mathematical Association of America Speakers Comittee, June 2004–January 2005.

Editor of the journal *Compositio Mathematica*, April 2004–.

Committee on Junior Appointments (Math Dept.), January 2004.

Committee on South Asian Studies at Princeton, 2003–.

Member, Executive Committee for a brainstorming workshop entitled "The Next Generation: Engineering Education for All Undergraduates" at the School of Engineering and Applied Science, Princeton University, Sept. 2003.

Gave guest lectures in a music theory class at Harvard University, and in Audrey Wright's "Jazz, Improvisation, and Culture" writing class at Princeton University, October 2003.

Served as Ph.D. thesis examiner at Harvard University, June 2003.

Lectured and advised students at the Clay Mathematics Institute High School Mathematics Seminar, May 2001 and May 2003.

Editor of *The Journal of Number Theory*, March 2003–.

Served as Freshman Advisor, Wilson College, Princeton University, 2001-2002.

Served on Committee to Broaden the Mathematics Major (with Ingrid Daubechies, Jordan Ellenberg, Simon Kochen, and Robert Fernholz), Princeton University, 2001-2002.

Gave (and continue to give) numerous free tabla drumming performances at student cultural programs, international fairs, and charity benefits on the Harvard and Princeton campuses.

Publications

"Higher composition laws I: A new view on Gauss composition, and quadratic generalizations", *Annals of Mathematics* **159** (2004), 217–250.

"Higher composition laws II: On cubic analogues of Gauss composition", *Annals of Mathematics* **159** (2004), 865–886.

"Higher composition laws III: The parametrization of quartic rings", *Annals of Mathematics*

159 (2004), 1329–1360.

"Higher composition laws IV: The parametrization of quintic rings", *Annals of Mathematics*, to appear.

"The density of discriminants of quartic rings and fields", *Annals of Mathematics*, to appear.

"The density of discriminants of quintic rings and fields", submitted.

"Conjectures on the density of number field discriminants", in preparation.

"Finiteness theorems for quadratic forms", preprint.

"The Gigapop Ritual: A Live Networked Performance Piece for Two Electronic Dholaks, Digital Spoon, DigitalDoo, 6 String Electric Violin, Rbow, Sitar, Tabla, and Bass Guitar," (with A. Kapur, G. Wang, P. Davidson, P. R. Cook, D. Trueman, and T. H. Park), *New Interfaces for Musical Expression (NIME)*, May 2003.

Higher Composition Laws, Ph. D. Thesis, Princeton University, 2001.

"Integer-valued polynomials and p-adic locally analytic functions," in preparation.

"A Mathematical Analysis of the Phonetic System of Sandhi", preprint.

"On the Conway-Schneeberger Fifteen Theorem," *Quadratic Forms and their Applications* (Dublin), Contemp. Math. **272**, Amer. Math. Soc., Providence, RI (1999), 27–37.

"The factorial function and generalizations," *American Mathematical Monthly* **107** (2000), no. 9, 783–799.

"Continuous functions on compact subsets of local fields" (with K. Kedlaya), *Acta Arithmetica* **91** (1999), no. 3, 191–198.

"P-orderings and polynomial functions on arbitrary subsets of Dedekind rings," *J. reine angew. Math.* **490** (1997), 101-127.

"Generalized factorials and fixed divisors over subsets of a Dedekind domain," *J. Number Theory* **72** (1998), no. 1, 67–75.

"Congruence preservation and polynomial functions from $\mathbb{Z}^n$ to $\mathbb{Z}^m$, *Discrete Mathematics* **173**, 1-3 (1997), 15-21.

"Factorizations relating to Dickson polynomials" (with M. Zieve), *Finite Fields and Their Applications* **5** (1999), no. 2, 103–111.