

Curriculum Vitae

Abhinav Kumar

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Personal Details

Address Department of Mathematics,
Harvard University,
1 Oxford Street,
Cambridge, MA 02138
(617) 230 9184

Citizenship Indian

Email abhinav@math.harvard.edu

Website <http://math.harvard.edu/~abhinav>

Education

2002 - 2006 Ph.D. in Mathematics, Harvard University

1998 - 2002 S.B. in Mathematics, Physics, and Computer Science,
Massachusetts Institute of Technology

Interests

Number theory, sphere packing, algebraic geometry, combinatorics,
quantum physics, theoretical computer science.

Publications

- *K3 surfaces associated to curves of genus two*, preprint, 2007.
- *Uniqueness of the $(22, 891, 1/4)$ spherical code*, with H. Cohn, J. Amer. Math. Soc. 20 (2007), no. 1, 99–148.
- *Universally optimal distribution of points on spheres*, with H. Cohn, preprint, 2004.
- *The D_4 root system is not universally optimal*, with H. Cohn, J. H. Conway and N. D. Elkies, preprint, 2004.
- *The densest lattice in twenty-four dimensions*, with H. Cohn, Electron. Res. Announc. Amer. Math. Soc. 10 (2004), 58–67, [arXiv:math.MG/0408174](http://arxiv.org/abs/math.MG/0408174).
- *Optimality and uniqueness of the Leech lattice among lattices*, with H. Cohn, preprint, 2003, [arXiv:math.MG/0403263](http://arxiv.org/abs/math.MG/0403263).
- *A proof of Pieri's formula using generalized Schensted insertion algorithm for RC-graphs*, with M. Kogan, Proc. Amer. Math. Soc. 130 (2002), 2525–2534, [arXiv:math.CO/0010109](http://arxiv.org/abs/math.CO/0010109).

Talks

- Princeton University/IAS: Number theory seminar, March 2004.
- Harvard University: Theory of computing seminar, April 2004.
- American Institute of Mathematics:
Workshop on Sphere packings, Lattices and Infinite dimensional algebra, August 2004.
- Mathematisches Forschungsinstitut Oberwolfach:
Workshop on Lattices and Applications, January 2005.
- Wesleyan University: Algebra seminar, March 2005.
- Calgary Workshop in Discrete Geometry, May 2005.
- Kyushu University: Second COE Workshop on Sphere Packings, June 2005.
- Harvard University: Number theory seminar, October 2005.
- Microsoft Research, January 2006.
- University of Michigan: Number theory seminar, January 2006.
- University of Pittsburgh: Mathematics Department colloquium, January 2006.
- Columbia University: Algebraic Geometry seminar, February 2006.
- Harvard-MIT Algebraic Geometry seminar, September 2006.
- Brandeis University: Everytopic seminar, October 2006.
- AMS Eastern Section Meeting, University of Connecticut, October 2006.
- Indian Institute of Science, December 2006.
- Microsoft Research India (Bangalore), December 2006.
- University of Washington: Number theory seminar, January 2007.

Awards and Honors

- Harvard GSAS Merit Fellowship, 2005-2006.
- Harvard Putnam Fellowship, 2002-2006.
- Jon A. Bucsela Prize in Mathematics, MIT, 2002.
- Member of Sigma Xi, Phi Beta Kappa, Sigma Pi Sigma, Tau Beta Pi honor societies.
- Fourth place in Boston Area Undergraduate Physics contest 2001.
- 16th place in William Lowell Putnam contest 2001.
- Third place in Boston Area Undergraduate Physics contest 2000.
- Putnam Fellow in William Lowell Putnam contest 2000.
- Second place in Boston Area Undergraduate Physics contest 1999.
- Putnam Fellow in William Lowell Putnam contest 1999.
- 18th place in William Lowell Putnam contest 1998.
- Gold medal at International Math Olympiad 1998.
- Silver medal at International Math Olympiad 1997.
- Indian National Talent Search scholar, 1996.

Teaching

- Counselor at PROMYS, a math camp for high school students, Boston University, summer 1999.
- Tutoring math and physics at MIT and Harvard.
- Instructor for “Topics in Group theory” tutorial, Harvard University, summer 2003.
- Instructor for Multivariable Calculus, Harvard University, fall 2003.
- Teaching Combinatorics and Computational Number Theory at the Math Circle, (a special program for talented middle and high school students), Northeastern University, fall 2004.
- Instructor for Linear Algebra, Harvard University, spring 2005.

Research Experience

- Research intern at Microsoft Research theory group, summer 2002. Worked on sphere packing problems.
- Research intern at Microsoft Research theory group, summer 2004. Worked on potential energy minimization problem.
- Visiting researcher at Microsoft Research theory group, Jan 2003, August 2003, May 2005.
- Postdoctoral researcher, Microsoft Research theory group, June 2006 - present.

References

- Professor Barry Mazur,
Department of Mathematics, Harvard University, One Oxford Street, Cambridge MA 02138
mazur@math.harvard.edu
- Professor Noam Elkies,
Department of Mathematics, Harvard University, One Oxford Street, Cambridge MA 02138
elkies@math.harvard.edu
- Professor Henry Cohn,
Microsoft Research, One Microsoft Way, Redmond WA 98052-6399
cohn@microsoft.com