

# Harald Andrés Helfgott – CV Summary

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*Birthdate:* November 25, 1977  
*Place of Birth:* Lima, Perú  
*Citizenship:* Peruvian

## Work Experience

2010— Researcher (CR1), CNRS/[École normale supérieure](#) (Paris)  
2006—2011 University of Bristol: Reader 2009—2011 (on leave 2010—2011),  
Senior Lecturer 2008—2009, Lecturer 2006—2008 (permanent since 2007)  
2004—2006 Post-doctoral fellow, CRM – ISM – Université de Montréal;  
Research Assistant Professor (post-doctoral), Concordia University.  
2003—2004 Gibbs Assistant Professor (post-doctoral), Yale University  
1998—2003 Teaching/Research Assistant, Princeton University  
1995—1997 Undergraduate Teaching Assistant, Brandeis University

## Other professional experience

Organized AGRA (Aritmética, Grupos y Análisis) summer school, Santiago, Chili, 2012  
Organized AQUA (Analytic Questions in Arithmetic) summer school, TIFR, Mumbai, 2010.  
Intensive courses taught in Peru (3), Cuba, Brazil, India (2), Bolivia, Switzerland, Chili (2)  
Invited professor in UAM (Madrid; 10-11/2012).

## Education

1998--2003 Princeton University, PhD in mathematics; viva date: April 2003; advisor: Henryk Iwaniec  
1994--1998 Brandeis University, B.A. summa cum laude in mathematics and computer science (05/98);  
highest honors in mathematics; highest honors in computer science

## Awards

2011 Adams prize (Cambridge)  
2010 Whitehead prize (London Mathematical Society)  
2008 Philip Leverhulme prize  
2007 Advanced Research Fellowship from EPSRC (Engineering and Physical Sciences Research Council)

## Papers

### Pure mathematics

25. [Major arcs for Goldbach's problem](#), preprint.
24. (with D. Platt) [Numerical verification of the ternary Goldbach conjecture up to 8.875e30](#), preprint.
23. [Growth in groups: ideas and perspectives](#), preprint.
22. (with N. Gill and M. Rudnev) [On growth in an abstract plane](#), to appear in *PAMS*.
21. [Minor arcs for Goldbach's problem](#), preprint.
20. [Bounds on the diameter of Cayley graphs of the symmetric group](#) (with J. Bamberg, N. Gill, T. Hayes, Á. Seress and P. Spiga), to appear in *J. Algebraic Combin.*
19. [Square-free values of  \$f\(p\)\$ ,  \$f\$  cubic](#), to appear in *Acta Math.*
- Th3. [Groupes, courbes et croissance](#), habilitation thesis, Paris-Sud (Orsay).
18. [On the diameter of permutation groups](#) (with Á. Seress), to appear in *Ann. of Math.*
17. [Deterministic methods to find primes](#) (as D. H. J. Polymath, with T. Tao and E. Croot), *Math. Comp.* 81 (2012), no. 278, 1233-1246.
16. [Growth in solvable subgroups of  \$GL\_t\(\mathbb{Z}/p\mathbb{Z}\)\$](#)  (with N. Gill), to appear in *Math. Annalen*.
15. [Growth of small generating sets in  \$SL\_n\(\mathbb{Z}/p\mathbb{Z}\)\$](#)  (with N. Gill), *Int. Math. Res. Notices.*, Vol. 2011, 4226--4251.
14. [An explicit incidence theorem in  \$F\_p\$](#)  (with M. Rudnev), *Mathematika*, 57 (2011), no. 1, 135--145.
13. [Improving Roth's theorem in the primes](#) (with A. de Roton), *Int. Math. Res. Notices.* (2011), Vol. 2011, 767--783.

12. [Growth in  \$SL\_3\(\mathbb{Z}/p\mathbb{Z}\)\$](#) , *J. Eur. Math. Soc. (JEMS)*, vol. 13, no. 3, pp. 761--851.
11. [Power-free values, repulsion between points, differing beliefs and the existence of error](#), CRM Proceedings and Lecture Notes, v. 46 (2008), 81-88.
10. [How small must ill-distributed sets be?](#) (with [A. Venkatesh](#)), in: Chen, W. W. L. (ed.) et al., *Analytic number theory. Essays in honour of Klaus Roth on the occasion of his 80th birthday*. Cambridge University Press, 2009, pp. 224-234.
9. [Growth and generation in  \$SL\_2\(\mathbb{Z}/p\mathbb{Z}\)\$](#) , *Ann. of Math.* 167 (2008), 601-623.
8. [The parity problem for irreducible polynomials](#), submitted.
7. [Power-free values, large deviations and integer points on irrational curves](#), *J. Théor. Nombres Bordeaux* 19 (2007), 433-472.
6. [The parity problem for reducible polynomials](#), *J. London Math. Soc. (2)* 73 (2006), 415-435.
5. [Integral points on elliptic curves and 3-torsion in class groups](#) (with [A. Venkatesh](#)), *J. Amer. Math. Soc.* 19 (2006), 527-550.
4. [Root numbers and ranks over global function fields](#) (with [B. Conrad](#) and [K. Conrad](#)), *Adv. Math.* 198 (2005), 684--731.
3. [On the behaviour of root numbers in families of elliptic curves](#), submitted.
2. [On the square-free sieve](#), *Acta Arith.* 115 (2004), 349-402.
- Th2. [Root numbers and the parity problem](#), Ph.D. thesis, Princeton University, April 2003, math.NT/0305435.
1. [Enumeration of tilings of diamonds and hexagons with defects](#) (with [I. M. Gessel](#)), *Electron. J. Combin.* 6 (1999), no. 1, R16.
- Th1. [Edge effects on local statistics in lattice dimers: a study of the Aztec diamond \(finite case\)](#), senior thesis, Brandeis University, May 1998, math.CO/0007136.
- Monographs – Pure mathematics**
- M1. [Azar y aritmética](#), Monografías del Instituto de Matemática y Ciencias Afines, v. 50, IMCA, Lima, Perú.
- History and Pedagogy**
- HP3. [A modern vision of the work of Cardano and Ferrari on quartics](#) (with [M. Helfgott](#)), CONVERGENCE, an online journal of the Mathematical Association of America, July 2009.
- HP2. [A noncalculus proof that Fermat's principle of least time implies the law of refraction](#) (with [M. Helfgott](#)), *Am. J. Phys.* 70 (2002), no. 12, 1224-1225.
- HP1. Maxima and minima before Calculus (with [M. Helfgott](#)), *Pro Mathematica* XII (1998), nos. 23-24, 135-158.

### Talks

56 invited talks at conferences and colloquia, 47 invited talks at seminars

### Administrative responsibilities

2013 –	Member of the editorial board of <i>Revista Matemática Iberoamericana</i>
2012/2013 –	Led the student seminar on analytic number theory at ENS
2012	Organized AGRA school at USACH, Santiago, Chile
2010	Organized AQUA school at TIFR, Mumbai, India
2008—2009	Co-organized workgroups on number theory and group theory at Bristol
2005	Organized additive combinatorics seminar at Montréal
2005/2006	Coorganizer of analytic number theory seminar at Montréal
2004/2005	Organized number-theory seminar at Yale

I program in C and Scheme. I can speak, read and write Spanish, English, French, German and Esperanto, and have had at least a few years of formal education or work experience in each of the first four ones. I also have some knowledge of Russian and Classical Greek.