

## DERRICK NORMAN HART

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CONTACT INFORMATION	Hill Center - Busch Campus Rutgers University Department of Mathematics Piscataway, NJ 08854-8019, USA	Email: <a href="mailto:dnhart@math.rutgers.edu">dnhart@math.rutgers.edu</a> Phone: Office: Hill 205 Office Phone: (732) 445-2390 x6030
PROFESSIONAL EXPERIENCE	<i>Hill Assistant Professor</i> Piscataway, NJ Mentor: Van Vu <i>Research and Teaching Assistant</i> Columbia, MO <i>VIGRE Fellow and Teaching Assistant</i> Atlanta, GA	Rutgers University 2008 - present  University of Missouri 2006 - 2008  Georgia Institute of Technology 2003 - 2006
EDUCATION	University of Missouri <i>Doctor of Philosophy in Mathematics</i> Advisor: Alex Iosevich Georgia Institute of Technology <i>Master of Science in Mathematics</i> Advisor: Michael Lacey University of Missouri <i>Bachelor of Science in Mathematics</i>	Columbia, MO 2008  Atlanta, GA 2006  Columbia, MO 2002
RESEARCH INTERESTS	Additive and Geometric Combinatorics, Harmonic Analysis and Geometric Measure Theory, Spectral Graph Theory, Analytic Number Theory	
GRANTS ACTIVITY	PI on the pending National Science Foundation grant proposal <i>Expanders, Fourier analysis and point-curve incidence theory</i> .  Co-PI with Alex Iosevich on the pending National Security Agency Mathematical Sciences Program grant proposal <i>Geometric combinatorics and additive number theory in vector spaces over finite fields</i> .	
JOURNAL REFEREE	Discrete Mathematics European Journal of Combinatorics Online Journal of Analytic Combinatorics SIAM Journal of Discrete Mathematics	Electronic Journal of Combinatorics Glasgow Mathematics Journal Proceedings of the American Mathematical Society
PUBLICATIONS	Total number of non-self citations: 79 (Includes some preprints; list provided upon request)  <ol style="list-style-type: none"><li>(with B. Banks, M. Sakata) <i>Almost all palindromes are composite</i>, Math. Res. Lett. <b>11</b> (2004), no. 5-6, 853–868.</li><li>(with A. Iosevich, J. Solymosi) <i>Sum-product estimates in finite fields via Kloosterman sums</i>, Int. Math. Res. Not. IMRN 2007, no. 5, Art. ID rnm007.</li><li>(with A. Iosevich) <i>Ubiquity of simplices in subsets of vector spaces over finite fields</i>, Anal. Math. <b>34</b> (2008), no. 1, 29–38.</li><li>(with A. Iosevich) <i>Sums and products in finite fields: an integral geometric viewpoint</i>, Contemporary Mathematics: Radon transforms, geometry, and wavelets <b>464</b> (2008).</li><li>(with B. Banks, P. Moree, W. Nevans) <i>The Nicolas and Robin inequalities with sums of two squares</i>, Monatsh. Math. 157 (2009), no. 4, 303–322.</li></ol>	

TO APPEAR

6. (with A. Iosevich, D. Koh, M. Rudnev) *Averages over hyperplanes, sum-product theory in vector spaces over finite fields and the Erdos-Falconer distance conjecture*, 26 pages. To appear in the Transactions of the American Mathematical Society.
7. (with A. Iosevich, D. Koh, S. Senger, I. Uriarte-Tuero) *Distance graphs in vector spaces over finite fields, coloring and pseudo-randomness*, 22 pages. To appear in Graphs and Combinatorics.
8. (with D. Covert, A. Iosevich, D. Koh, M. Rudnev) *Generalized incidence theorems, homogeneous forms, and sum-product estimates in finite fields*, 17 pages. To appear in the European Journal of Combinatorics.
9. (with E. Croot) *Sums and products in  $\mathbb{C}[x]$* , 25 pages. To appear in the Ramanujan Journal.

SUBMITTED WORK

10. (with J. Chapman, M. B. Erdoğan, A. Iosevich, D. Koh) *Pinned distance sets,  $k$ -simplices, Wolff's exponent in finite fields and sum-product estimates*.
11. (with D. Covert, A. Iosevich, S. Senger, I. Uriarte-Tuero), *A Furstenberg-Katznelson-Weiss type theorem on  $(d + 1)$ -point configurations in sets of positive density in finite field geometries*.
12. (with E. Croot),  *$k$ -fold sums from a set with few products*.
13. (with S. Backman, E. Croot, M. Hamel) *Sum-product inequalities with perturbation*.
14. (with A. Nizolek), *Some results on the sums and products of real numbers*.(Undergraduate research project)
15. (with L. Li, C.-Y. Shen) *Fourier analysis and expanding phenomena in finite fields*.

BOOKS

D. Hart, A. Iosevich, *Geometric combinatorics in vector spaces over finite fields*, In preparation.

SELECTED  
INVITED  
TALKS

*Fourier analysis and expanding phenomena in finite fields*, **Institute For Pure and Applied Mathematics - Analytical Methods in Combinatorics, Additive Number Theory and Computer Science**, Los Angeles, CA (upcoming December 2009)

*Sum-product theory in finite fields*, **Fields Institute - Workshop on Harmonic Analysis**, Toronto, Ontario (February 2008)

*Sums and products in finite fields*, **NSF FRG Conference - New Developments in Harmonic Analysis**, Athens, GA (October 2007)

TEACHING  
ACTIVITIES

Rutgers University  
*Hill Assistant Professor* Piscataway, NJ  
2008-Current

**Instructor**

*Calculus I for the Mathematical and Physical Sciences.*  
*Calculus II for the Mathematical and Physical Sciences.*  
*Honors Calculus II for the Mathematical and Physical Sciences.*

**Undergraduate Research**

Supervised an undergraduate research project with Alexander Nizolek.

University of Missouri  
*Teaching Assistant*

Columbia, MO  
2006 - 2008

**Instructor**

*College Algebra for Calculus Bound Students.*  
*Calculus for Social and Natural Sciences.*  
Guest lecturer for Putnam preparation course.

**MyMathLab Coordinator**

Two semesters - Acted as MyMathLab coordinator for forty to fifty sections of Intermediate and College Algebra.