

SAMUEL BLOOM, PH.D.

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OBJECTIVE

Work as research mathematician in public or private sector. Current research interests in number theory and algebraic geometry for cryptographic application.

EDUCATION

University of Maryland, College Park

Doctor of Philosophy, Mathematics.

Aug. 2012 - May 2018

College Park, MD

- **Advisor:** Dr. Lawrence C. Washington. **GPA:** 3.95.
- **Thesis:** “Lang-Trotter Questions on the Reductions of Abelian Varieties”
- Ralph P. Pass III Fellowship for Excellence in Number Theory, April 2016.
- Relevant coursework: Algebraic Number Theory, Analytic Number Theory, Elliptic Curves (audit), Moduli of Elliptic Curves (audit) Algebraic Surfaces, Zeta Functions, Algebraic Geometry, Stacks (audit), Geometric Invariant Theory (audit), Mathematical Logic.

University of Maryland, College Park

Master of Arts, Mathematics.

May 2016

College Park, MD

- Scholarly Paper: “Denominators of Igusa Class Polynomials and Superspecial Reduction of Abelian Surfaces”

University of Chicago

Bachelor of Science, Mathematics, with Honors. June 2012.

Aug. 2008 - June 2012

Chicago, IL

- **GPA:** 3.67.
- Dean’s List, Sept. 2008 - June 2012.

PUBLICATIONS

1. “Almost Prime Values of the Order of Abelian Varieties over Finite Fields,” arXiv: 1803.03698.
2. “The Square Sieve and a Lang-Trotter Question for Generic Abelian Varieties.” *J. Number Theory*, **191** (2018) 119-157.
3. A. Vu, Y. Qin, C.-K. Lin, A. Abouimrane, A. K. Burrell, S. Bloom, D. Bass, J. Bareño, I. Bloom, “Effect of Composition on the Voltage Fade Phenomenon in Lithium-, Manganese-Rich $x\text{LiMnO}_3 \cdot (1-x)\text{LiNi}_a\text{Mn}_b\text{Co}_c\text{O}_2$: A Combinatorial Synthesis Approach.” *J. Power Sources*, **294** (2015) 711-718.

PRESENTATIONS

1. “Almost-Prime Orders of the Reductions of Abelian Varieties,” Uni. of MD, Fall 2017.
2. “The Square Sieve and a Lang-Trotter Question for Generic Abelian Varieties,” Uni. of MD, Spring 2017.
3. “Conjectures on the Reductions of Abelian Varieties over the Rationals,” Uni. of MD, Fall 2016.
4. “Computing with Isogeny Graphs,” Uni. of MD, Spring 2016.

5. “Denominators of Igusa Class Polynomials and Superspecial Reduction of Abelian Surfaces,” Candidacy Exam, Uni. of MD, Fall 2015.
6. “Constructing Abelian Varieties for Cryptography,” Uni. of MD, Fall 2015.
7. “Theta Functions and ($g \geq 2$)-Cryptography,” Uni. of MD, Summer 2015.
8. “The Weil Pairing and its Applications,” Uni. of MD, Spring 2015.
9. “Visualizing Imaginary Quadratic Fields via Möbius Transformations” Uni. of MD, Fall 2014.
10. “The Riemann Hypothesis for Curves over \mathbb{F}_q via Linear Algebra,” Uni. of MD, Spring 2014.
11. “On Weil Restriction,” Uni. of MD, Fall 2013.

TEACHING AND WORK EXPERIENCE

Graduate Teaching Assistant

University of Maryland, College Park

Aug. 2012 - present

College Park, MD

- Produced and taught linear algebra, calculus, and precalculus courses independently (MATH 141, Summer 2017; MATH 115, Summer 2015; MATH 240, Summer 2014).
- Led discussion sections, held office hours, graded quizzes and exams, and tutored for calculus, number theory, linear algebra, and cryptography courses (MATH 140, 141, 220, 240, 241, 406, 456).
- Aziz/Osborn Gold Medal in Teaching Excellence, May 2014.

Directed Reading Program President

University of Maryland, College Park. May 2016 - present

- Organized, planned undergraduate research projects; coordinated graduate-undergraduate mentorings.
- Mentored undergraduate in an independent-study program in mathematical logic.

Young Scholars Program Counselor

University of Chicago

June 2012 - Aug. 2012; June 2010 - Aug. 2010

Chicago, IL

- Taught abstract algebra, number theory, computer algebra systems to Chicago-area high school students.
- Stimulated mathematical interest in young students, in particular women and minority students, to encourage pursuit of higher mathematical education.

COMPUTER LANGUAGES AND SKILLS

Python, Sage, Microsoft Office Suite, LaTeX (mathematics typesetting).

INTERESTS AND ACTIVITIES

- Organizer, Tikkun Leil Shabbat (Jewish congregation)
- Fundraising Chair, University of Chicago Fencing Team.
- Captain, University of Chicago Scavenger Hunt team.
- Proficiency in written and spoken Spanish.
- Amateur ukulele and guitar player.

REFERENCES

Lawrence Washington (Ph.D. Advisor). *Phone:* 301-405-5116. *Email:* lcw@math.umd.edu.

Niranjan Ramachandran. *Phone:* 301-405-5080. *Email:* atma@math.umd.edu.

More references available upon request.