

1. CONTACT INFORMATION

Phone: +1 (617) 495-2482
E-mail: chisholm@math.harvard.edu
Office: Science Center 423
Website: math.harvard.edu/people/ChisholmSarah

Mailing Address:
Department of Mathematics
Harvard University
One Oxford Street
Cambridge MA, 02138 USA

2. EMPLOYMENT

- **Preceptor**, Harvard University, Department of Mathematics
– 2013 – present

3. EDUCATION

- **Doctor of Philosophy**, Mathematics, University of Calgary, Calgary AB (2014)
 - Advisors: Drs. Mark Bauer & Matthew Greenberg
 - Subject Area: Number Theory – Quaternionic Lattices & Algebraic Modular Forms
 - Title of Thesis: *Algorithmic enumeration of quaternionic lattices*
- **Master of Science**, Mathematics, University of Calgary, Calgary AB (2008)
 - Advisors: Drs. Mark Bauer & Hugh Williams
 - Subject Area: Number Theory & Cryptography – Elliptic Curves & Pairings
 - Title of Thesis: *Taxonomy of cryptographic pairings*
- **Bachelor of Science**, Mathematics, Dalhousie University, Halifax NS (2006)
 - First Class Honours
 - Advisor: Dr. Keith Johnson
 - Subject Area: Number Theory & Cryptography – Number Field Sieve
 - Title of project: *A ‘fast’ factoring method: the number field sieve*

4. AWARDS, DISTINCTIONS & FELLOWSHIPS

4.1. Teaching.

- Harvard University Certificate of Teaching Excellence: Math Mb (Spring 2014)
- Harvard University Certificate of Teaching Excellence: Math 1b (Fall 2014)
- Harvard’s Levenson Memorial Teaching Prize, finalist (Spring 2015)

4.2. Graduate:

- Nominated for the Women’s Resource Centre’s: Distinguished Student Award – University of Calgary (2013)
- Queen Elizabeth II (2012–2013)

- Natural Sciences and Engineering Research Council of Canada – Postgraduate Scholarship, Doctorate (2010–2012)
- Informatics Circle of Research Excellence Studentship (2008–2011)
- Graduate Assistant Teaching, Doctorate (2008–2012)
- Queen Elizabeth II (2008–2009)
- Eric Milner Award (2008–2009)
- Natural Sciences and Engineering Research Council of Canada: Postgraduate Scholarship, Masters (2007–2008)
- Fred A. McKinnon Teaching Excellence Award (2007–2008)
- Alberta Graduate Student Scholarship (2007–2008)
- Graduate Assistant Teaching, Masters (2006–2008)
- Informatics Circle of Research Excellence Studentship (2006–2008)

4.3. Undergraduate:

- Deans List (2003–2005)
- Canadian Millennium Scholarship (2003–2004)
- Millennium Excellence Award (2003–2004)
- Dalhousie Entrance Scholarship (2001–2002)
- Nova Scotia Royal Canadian Legion Bursary (2001–2002)

5. RESEARCH INTERESTS

Number Theory, Algorithms, Algebraic Geometry, Arithmetic Geometry, Elliptic Curves, Modular Curves, Heegner Points, Shimura Curves, Cryptography, Lattices, Quaternion Algebras, Quaternionic Unitary Groups, Algebraic Modular Forms, Ramanujan Supercongruences, and Mathematical Education.

6. PAPERS

- *Algorithmic enumeration of quaternionic lattices*, (2014) Doctoral Thesis, University of Calgary.
- *p -adic analogues of Ramanujan type formulas for $1/\pi$* , (2013) accepted to Mathematics (with Alyson Deines, Ling Long, Gabrielle Nebe and Holly Swisher).
- *Recent advances for Ramanujan supercongruences*, (2013) accepted to the Proceedings for Women in Numbers II, (with Alyson Deines and Holly Swisher).

- *Pairings on Hyperelliptic Curves*, (2011) Women in Numbers: Research Directions in Number Theory, Fields Institute Communications, vol. 60, Amer. Math. Soc., Providence, RI, 2011, pp. 87-120 (with Jennifer Balakrishnan, Juliana Belding, Kirsten Eisentrger, Katherine Stange and Edlyn Teske).
- *Taxonomy of Cryptographic Pairings*, (2008) Master's Thesis, University of Calgary.

7. PAPERS IN PREPARATION

- *Computing Siegel modular forms*, (with Jennifer Balakrishnan, Sorina Ionica, Kristin Lauter and Christelle Vincent).

8. INVITED TALKS

- *Bottle Calibration and Rates of Change*. (2014) Thomas Lovering's (Harvard University) Math Circle – Northeastern University, Boston MA.
- *Geometric Series*. (2013) Nathan Pflueger's (Harvard University) Math Circle – Northeastern University, Boston MA.
- *Combining concepts graphically: limits, continuity and differentiation*. (2013) Calculus demonstration to Preceptor group – Harvard University, Cambridge MA.
- *Quaternionic lattice neighbours and automorphic forms*. (2013) Joint Mathematics Meetings – Special Session on L -Functions and Arithmetic Geometry, San Diego CA.
- *Logical puzzles – solving mysteries*. (2011) Canadian Mathematical Society – Alberta Mathematics Camp, Calgary AB.
- *Calculus I: review session*. (2011) For the Society of Calgary Undergraduate Mathematics, Calgary AB.
- *Hyperelliptic Pairings and Shimura Curve Uniformizations of Elliptic Curves*. (2009) Eric Milner Award recipient colloquium, Calgary AB.
- *Pairings*. (2009) Elliptic Curve Cryptography – Summer School, Calgary AB.

9. RESEARCH EXPERIENCE

9.1. Independent projects:

- *Taxonomy of cryptographic pairings*. (2008) Master's thesis. Having had the experience of writing a master's thesis is quite advantageous for writing a doctoral thesis. Particularly, having a sense of the time-line required to produce the work and the level of scrutiny which is necessary, has been most valuable.

- *A ‘fast’ factoring method: the number field sieve.* (2006) Honours Research Project. I researched the subject area, examined the literature carefully and analytically, wrote a survey paper, and applied the sieve to produce a basic example.

9.2. Collaborative projects:

- *Women in Sage III.* (2012) Sage Days 42 workshop, Wallace Falls WA. This meeting was an excellent opportunity to further develop computation skills. After the workshop I became a developer for the open source software program Sage. Our group began a project, on computations of Siegel modular forms, which is still in progress.
- *Contemporary methods for solving Diophantine equations.* (2012) Banff AB. This workshop was a wonderful opportunity to study an area of number theory which I was previously unfamiliar with, with other number theorists.
- *Ramification and Geometry.* (2012) Arizona Winter School, Tucson AZ. The school was an excellent opportunity to meet researchers and work on challenging mathematical problems in a field quite distinct from my own.
- *Women in Numbers 2.* (2011) Banff AB. This workshop was a second opportunity to work with a group of women on a research project. Our paper on Ramanujan supercongruences is still in preparation and a survey paper related to this work has been submitted to the conference proceedings.
- *Stark-Heegner points.* (2011) Arizona Winter School, Tucson AZ. This group project was mainly centered around working through difficult mathematical problems. Many of the students came from highly competitive environments and essential group dynamic skills were developed.
- *Women in Sage.* (2010) Sage Days 26 workshop, Seattle WA. I first was introduced to the advantages of computer programming in mathematics at this workshop as well as Sage mathematical software development.
- *Women in Numbers.* (2008) Banff AB. I learned how to produce an article in a group setting. I also had the opportunity to see the the entire process of producing a paper, from developing the ideas, to writing the paper, to submitting the article and having it published.

10. GRADUATE STUDENT TEACHING EXPERIENCE

- *Instructor.* (2012) University of Calgary.
 - Introductory Calculus. Fall semester: 240 students. The Intro. Calculus courses were coordinated for all sections by Dr. Mark Bauer. I utilized his lecture slides

and built my class notes accordingly. Along with the other instructors, I contributed to the design of the exams. Coordination was wonderful for economizing tasks and to draw from the expertise of Dr. Bauer and the other experienced instructors.

- Introductory Calculus. Winter semester: 120 students. I sought out the most experienced instructor teaching the same course, Dr. Viena Stastna, and coordinated my class with hers. We split the duty in half for creating the tests, midterm, final exam, practice problems and grading. Additionally, I followed her course notes and learned a great deal from her expertise.
- *Co-Instructor.* (2011) University of Calgary. Phase II: Instructional Training Program, with mentor Dr. Joseph Ling. Introductory Calculus. Following the teaching style of Dr. Ling, I taught 1/3 of the lectures of this course and contributed, proportionally, to the other components of the instructional duties.
- *Guest lecturer.* (2010) University of Calgary. Phase I: Instructional Training Program, with mentor Dr. Clifton Cunningham. Linear Algebra.
- *Instructor.* (2010) SAIT Polytechnic. Grade 12 mathematics equivalence course. 30 students. From a syllabus I designed the course which met the required outcomes for the students. I created the tests and final exam as well.
- *Laboratory instructor.* (2006–2012) University of Calgary. Mathematical Explorations, Introductory and Intermediate Calculus.
- *Grader.* (2002–2005) Dalhousie University. Marked assignments for Introductory and Intermediate Calculus and Linear Algebra classes.

11. PROFESSIONAL DEVELOPMENT

- *University Teaching Certificate.* (2011) University of Calgary. A program which integrates learning, instructional theory and practice, along with valuable skills to promote active learning, critical thinking and inquiry approaches in the classroom.
- *Course Design Workshop.* (2010) University of Calgary. A workshop for designing or modifying a course with the students in mind.
- *Instructional Skills Workshop.* (2010) University of Calgary. An introduction to important instructional concepts with a requirement to teach three short video recorded lessons and receive constructive feedback.

12. PRESENTATIONS

- *Algorithmic enumeration of quaternionic lattices.* (2014) Dissertation defense, Calgary AB.

- *Lattice construction using the neighbouring method of Kneser.* (2012) 9th Pacific Institute for the Mathematical Sciences (PIMS) Young Researchers Conference, Calgary AB.
- *Ramanujan type supercongruences for $K3$ surfaces.* (2011) Women in Numbers II Workshop, Banff AB.
- *Computing points on elliptic curves using Shimura curves.* (2011) 8th PIMS Young Researchers Conference, Vancouver BC.
- *Instructional training for graduate students.* (2011) Calculus $11 \times 11 \times 11$ (November 11, 2011), Banff AB.
- *Computing Heegner Points on Elliptic Curves (a more accessible approach).* (2011) Dept. of Mathematics, Calgary AB.
- *Hyperelliptic Pairings.* (2009) Western Number Theory, Monterey CA.
- *Hyperelliptic Pairings.* (2009) 6th PIMS Young Researchers Conference, Calgary AB.

- *The Hilbert Symbol.* (2009) Dept. of Mathematics, Calgary AB.
- *Proper Morphism of Schemes.* (2009) Dept. of Mathematics, Calgary AB.
- *Pairings on hyperelliptic curves.* (2008) Women in Numbers, Banff AB.
- *Cryptographic Pairings.* (2008) Dept. of Mathematics, Calgary AB.
- *Mathematical Education: A lecture on teaching Calculus.* (2008) Dept. of Mathematics, Calgary AB.
- *Miller's Algorithm.* (2008) Dept. of Mathematics, Calgary AB.
- *A Categorical Perspective of Sheaves.* (2007) Dept. of Mathematics, Calgary AB.
- *Pigeon Hole & Double Counting: Proofs from The Book.* (2007) Dept. of Mathematics, Calgary AB.
- *Braid Groups.* (2006) Dept. of Mathematics, Calgary AB.
- *Pairing Friendly Elliptic Curves.* (2006) Dept. of Mathematics, Calgary AB.
- *The Number Field Sieve.* (2006) Dept. of Mathematics, Halifax NS.

13. CONFERENCES ATTENDED

- *p -adic Variation in Number Theory.* (2014) Boston MA.
- *Curves and Automorphic Forms.* (2014) Phoenix AZ.
- *Sage Days 56: Computational Number Theory and the Cloud.* (2014) Oahu HI.
- *Arizona Winter School: Modular Forms.* (2013) Tucson AZ.
- *Joint Mathematics Meetings.* (2013) San Diego CA.
- *Sage Days 42: Women in Sage III.* (2012) Wallace Falls WA.

- Algorithmic Number Theory Symposium X. (2012) San Diego CA.
- 9th PIMS Young Researchers Conference. (2012) Calgary AB.
- Canadian Number Theory Association XII meeting. (2012) Lethbridge AB.
- Contemporary methods for solving Diophantine equations. (2012) Banff AB.
- Atkin Memorial Workshop: Elliptic Curves over $\mathbb{Q}(\sqrt{5})$. (2012) Chicago IL.
- Arizona Winter School: Ramification and Geometry. (2012) Tucson AZ.
- Calculus $11 \times 11 \times 11$. (2011) Banff AB.
- Women in Numbers 2. (2011) Banff AB.
- Alberta Number Theory Days. (2011) Banff AB.
- Analytic Aspects of L-functions & Applications to Number Theory. (2011) Calgary AB.
- 8th PIMS Young Researchers Conference. (2011) Vancouver BC.
- Pacific Northwest Number Theory. (2011) Bellingham WA.
- Arizona Winter School: Stark-Heegner points. (2011) Tucson AZ.
- Sage Days 26: Women in Sage. (2010) Seattle WA.
- Elliptic Curve Cryptography Conference. (2010) Seattle WA.
- Magma Conference on p -adic L -functions. (2010) Montreal QC.
- Western Number Theory. (2009) Monterey CA.
- Elliptic Curve Cryptography Conference. (2009) Calgary AB.
- Selected Areas of Cryptography. (2009) Calgary AB.
- 6th PIMS Young Researchers Conference. (2009) Calgary AB.
- Alberta Number Theory Day. (2009) Calgary AB.
- *ABC*-Algebra Workshop. (2009) Calgary AB.
- Women in Numbers. (2008) Banff AB.
- Elliptic Curve Cryptography Conference. (2008) Utrecht, Netherlands.
- Trilateral Security Conference. (2008) Calgary AB.
- Algorithmic Number Theory Symposium. (2008) Banff AB.
- Elliptic Curve Cryptography Conference. (2007) Dublin, Ireland.
- Canadian Undergraduate Math. Conference. (2006) Montreal QC.
- Canadian Undergraduate Math. Conference. (2004) Halifax NS.

14. SERVICE

14.1. Mentoring.

- *Mentor for fellow teaching assistants.* (2011–2012) University of Calgary. Through classroom evaluation and discussions of pedagogy I mentored a number of undergraduate and graduate students.

14.2. Supervisory Experience.

- *Advising teaching assistants.* (2012) Having experience teaching large classes has given me the opportunity to supervise the teaching assistants associated with the course. Some of the assistants have had minimal experience and have required more evaluation and feedback, a valuable experience, in and of itself.

14.3. Project Management.

- *Developing the Quaternion Algebra component of the Sage Library: with Alison Deines at University of Washington.* (2012) This is an ongoing project to expand the functionality of Sage, benefitting both of our own research projects, but useful for many others in the field. Via weekly meetings, we update our progress, providing motivation for one another.
- *Instructional Training Program for Graduate Students.* (2010–2012) I have developed this program to prepare graduate students for teaching large lecture sections of introductory courses through a series of phases. I went through the program in a pilot stage, and now it is officially implemented in our department.

14.4. Conference Organization.

- *9th PIMS Young Researchers Conference.* (2012) Calgary AB. Along with a few other fellow students, we hosted this conference. Apart from typical preparations, we also provided participants with feedback on their abstracts and their presentations to aid in their own professional development.

14.5. Elected positions held and volunteer work.

- *Vice President of Academics, Graduate University of Calgary Mathematics Society.* (2011–present) Dept. of Mathematics & Statistics, University of Calgary, Calgary AB. Academic representative for the graduate students within the department.
- *Canadian Mathematical Society- Alberta Math Camp.* (2011) Calgary AB. Lecturer for students of ages 12-16 years.
- *Calgary Jr. Math Contest.* (2011) Calgary AB. Marker for Grade 9 mathematics competition.
- *Vice President of Events, Graduate University of Calgary Mathematics Society.* (2007–2011) Dept. of Mathematics & Statistics, University of Calgary, Calgary AB. One of the founding members for this society. Representative for the graduate students and organizer for social events within the department.
- *Faculty of Science Academic Appointment Review Committee member, student representative.* (2008–2010) University of Calgary, Calgary AB.

- *Referee*, for Selected Areas in Cryptography. (2010)
- *Faculty of Science, graduate student representative for the Dept. of Mathematics & Statistics*. (2007–2009) University of Calgary, Calgary AB.
- *Chair of the Graduate Party Association*. (2007–2008) Dept. of Mathematics & Statistics, University of Calgary, Calgary AB. Organizer for celebrations for each graduating graduate students within the department.
- *Assistant Organizer for Interdepartmental Soccer*. (2007–2008) Dept. of Mathematics & Statistics, University of Calgary, Calgary AB. Organizer for recreational indoor and outdoor soccer games for members of the department.
- *President of Dalhousie University's Mathematics & Statistics Society*. (2004–2005) Dept. of Mathematics & Statistics, Dalhousie University, Halifax NS. Organized weekly meetings, planned social events for the department, and organized final exam tutorials for first year students.
- *Treasurer of Dalhousie University's Mathematics Society*. (2005–2006) Dept. of Mathematics & Statistics, Dalhousie University, Halifax NS. Organized financial aspects of the society.

15. SPOKEN LANGUAGES

- *English* (native language)
- *French*

16. COMPUTING LANGUAGES

HTML, Java, L^AT_EX, Python, Magma, Maple, Ruby and SAGE.

17. REFERENCES

TABLE 1. Teaching References

Contact: Dr. Michael Lamoureux	Mailing Address:
Position: Professor, Department Head	University of Calgary
Phone: +1 (403) 220-8214	Dept. of Mathematics & Statistics
E-mail: mikel@math.ucalgary.ca	2500 University Drive NW
Website: http://math.ucalgary.ca/~mikel	Calgary AB, Canada T2N 1N4

Contact: Dr. Viena Stastna	Mailing Address:
Position: Senior Instructor	University of Calgary
Phone: +1 (403) 220-3345	Dept. of Mathematics & Statistics
E-mail: vstastna@math.ucalgary.ca	2500 University Drive NW
Website:	Calgary AB, Canada T2N 1N4
http://math.ucalgary.ca/profiles/viena-stastna	

TABLE 2. Research References

Contact: Dr. Mark Bauer Position: Associate Professor Phone: +1 (403) 210-8456 E-mail: mbauer@math.ucalgary.ca Website: http://math.ucalgary.ca/~bauerm	Mailing Address: University of Calgary Dept. of Mathematics & Statistics 2500 University Drive NW Calgary AB, Canada T2N 1N4
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Contact: Dr. Matthew Greenberg Position: Assistant Professor Phone: +1 (403) 220-3952 E-mail: mgreenbe@ucalgary.ca Website: http://math.ucalgary.ca/~mgreenbe	Mailing Address: University of Calgary Dept. of Mathematics & Statistics 2500 University Drive NW Calgary AB, Canada T2N 1N4
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Contact: Dr. Ling Long Position: Associate Professor Phone: +1 (515) 294-8150 E-mail: linglong@iastate.edu Website: http://orion.math.iastate.edu/linglong	Mailing Address: Iowa State University Dept. of Mathematics 396 Carver Hall Ames IA, USA 50011
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Contact: Dr. Holly Swisher Position: Associate Professor Phone: +1 (541) 737-5167 E-mail: swisherh@math.oregonstate.edu Website: http://www.math.oregonstate.edu/people/view/swisherh	Mailing Address: Oregon State University Dept. of Mathematics Corvallis OR 97331-4605 USA
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Contact: Dr. Edlyn Teske-Wilson Position: Associate Professor E-mail: eteske@uwaterloo.ca Website: http://www.math.uwaterloo.ca/~eteske	Mailing Address: University of Waterloo Dept. of Combinatorics & Optimization Waterloo ON, Canada N2L 3G1
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