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Current position

Brookfield Research Professor, University of Waterloo (2008-Present)
(responsibilities include undergraduate and graduate teaching, supervision of graduate students, independent research, committee service, etc.)

Past Professional Experience

NSERC Postdoctoral Fellow, University of Toronto (2006 – 2008)
Instructor and Teaching Assistant, University of British Columbia (1999 – 2006)
Teaching Assistant, Simon Fraser University, (1999)

Education

Ph.D. in mathematics, University of British Columbia (2006)
Supervisor: M. A. Bennett
Thesis: *Contributions to the arithmetic of elliptic curves*

M.Sc. in mathematics, University of British Columbia (2002)
Thesis: *O-minimal expansions of the reals*

B.Sc. in mathematics (honours), Simon Fraser University (1999)

Awards and Grants

NSERC Discovery Grant (5 year, \$18,000 per year) (2009 – 2014)
NSERC Postdoctoral Fellowship (2006 – 2008)
University Graduate Fellowship, University of British Columbia (held twice)
NSERC Undergraduate Research Award, at Simon Fraser University (1999)
Tadeuz Specht Scholarship, Simon Fraser University (1995)

Research Interests

My main area of interest at the moment is arithmetic dynamics, which examines the overlap between number theory and dynamical systems. In particular, I focus mainly on dynamical problems which are analogous to results in classical arithmetic geometry. I also maintain an interest in arithmetic geometry *per se*, mainly in the arithmetic of elliptic curves and surfaces, and in diophantine equations.

Service

- Organizer of special sessions at the 2011 CMS Summer Meeting and AMS 2011 Spring Western Section Meeting, both pending approval.
- Reviewer for *Math Reviews* and *Zentralblatt*.
- Referee for *Abstract and Applied Analysis*, *Algebra and Number Theory*, *Ars Combinatoria*, *Canadian Bulletin of Mathematics*, *Duke Mathematical Journal*, *Journal of Number Theory*, *Transactions of the AMS*, *Proceedings and Journal of the LMS*, and *Manuscripta Mathematica*
- Supervisor of Learning Seminar in Number Theory, Waterloo (2008–2010)
- Curriculum Committee (Pure Mathematics), Waterloo (2008–present)
- Graduate Student Seminar series organizer, UBC (2002)
- Typesetter for *Journal of Symbolic Logic*. (1999–2002)
- Undergraduate Studies Committee (Mathematics Department), SFU (1999)

Publications (in approximate reverse chronological order)

- [1] Multiplicative uniformization of non-archimedean dynamical systems, (~ 12 pages; in preparation)
- [2] Variation of the canonical height in a family of polynomials, (23 pages; submitted; available on the arxiv)
- [3] Cubic polynomials with periodic cycles of a specified multiplier, (26 pages; submitted; available on the arxiv)
- [4] Specializations of elliptic surfaces, and divisibility in the Mordell-Weil group, (23 pages; to appear in *Algebra and Number Theory*)
- [5] Numerical evidence for a conjecture of Poonen, (joint work with B. Hutz; 8 pages; to appear in *Rocky Mountain Journal of Mathematics*)
- [6] Uniform bounds on pre-images under quadratic dynamical systems, *Mathematical Research Letters* **16** (2009), no. 1, 87–101 (joint paper with X. W. C. Faber, B. Hutz, R. Jones, M. Manes, T. J. Tucker, and M. E. Zieve)
- [7] Lower bounds on the canonical height associated to the morphism $\phi(z) = z^d + c$, *Monatshefte für Mathematik* **157** (2009), pp. 69–89.
- [8] Primitive divisors in arithmetic dynamics, *Mathematical Proceedings of the Cambridge Philosophical Society* **146** (2009), no. 2, pp. 289–302 (joint paper with J. H. Silverman)
- [9] Multiples of integral points on elliptic curves, *Journal of Number Theory* **129** (2009), no. 1, pp. 182–208.
- [10] Primitive divisors on twists of the Fermat cubic, *LMS Journal of Computation and Mathematics* **12** (2009), pp. 54–81.
- [11] The uniform primality conjecture for elliptic curves, *Acta Arithmetica* **134** (2008), pp. 157–181 (joint paper with G. Everest, V. Mahé, and S. Stevens)
- [12] A quantitative primitive divisor result for elliptic divisibility sequences, to appear in *Journal de Théorie des Nombres de Bordeaux* (25 pages)
- [13] Approximating algebraic numbers by j -invariants of elliptic curves, *Acta Arithmetica* **131** (2008), pp. 57–68.

- [14] Uniform estimates for primitive divisors in elliptic divisibility sequences, to appear in Serge Lang commemorative volume (29 pages; with J. H. Silverman)
- [15] Elliptic divisibility sequences over certain curves, *Journal of Number Theory* **123** (2007), pp. 473–486.
- [16] Diophantine analysis and torsion on elliptic curves, *Proceedings of the LMS* **94** no. 1 (2007), pp. 137–154.
- [17] Contributions to the arithmetic of elliptic curves, Ph.D. Thesis, University of British Columbia (2006)
- [18] On k -th power numerical centres, *Comptes rendus mathématiques de l'Académie des sciences* (2005)
- [19] Torsion subgroups of elliptic curves in short Weierstrass form, *Transactions of the AMS* **357** no. 8 (2005), pp. 3325–3337 (joint paper with M. A. Bennett).
- [20] O-minimal expansions of the reals, M.Sc. Thesis, University of British Columbia (2002)

Selected Lectures and Presentations (* = by invitation; otherwise contributed)

- *Variation of the canonical height for a family of polynomials*
 CNTA XI*, Wolfville (2010)
 Algebraic Dynamics Conference 2010, New York (2010)
- *Periodic points for polynomials over number fields*
 Workshop on Discovery and Experimentation in Number Theory*,
 Fields Institute, Toronto (2009)
- *Preimages in arithmetic dynamics*
 Number Theory Seminar*, University of Rochester (2009)
- *Specialization of elliptic surfaces, and divisibility in the Mordell-Weil group*
 Arithmetic of Surfaces*, Lorentz Center (2010)
 Number Theory Seminar*, CUNY Graduate Center (2009)
 Arithmetic Geometry Seminar*, McMaster University (2008)
- *Number theory and dynamical systems*
 Colloquium*, Department of Pure Mathematics, Waterloo (2008)
- *An introduction to arithmetic dynamics*
 Plenary talk*, ISM Graduate Student Conference, Montréal (2008)
- *Arithmetic questions about iterates of quadratic polynomials*
 Québec-Vermont Number Theory Seminar*, Montréal (2008)
- *Diophantine approximation in arithmetic dynamics*
 Joint Number Theory Seminar*, Simon Fraser U. (2007)
 Number Theory Seminar*, University of Toronto (2007)
- *Primitive divisors in elliptic divisibility sequences*
 Pure Maths Seminar*, University of East Anglia (2007)
 Number Theory Seminar*, University of Nottingham (2007)
 Number Theory Seminar*, University of Warwick (2007)
- *Multiples of integral points on elliptic curves*
 Number Theory Seminar*, University of Waterloo (2007)
- *Primitive divisors in elliptic divisibility sequences*

- Colloquium*, University of Toronto (2006)
- *Elliptic divisibility sequences and integral points on elliptic curves*
Arithmetic Geometry Seminar*, McMaster University (2006)
- *Primitive divisors in elliptic divisibility sequences*
CNTA IX, Vancouver (2006)
- *S-integral points on elliptic curves*
Analytic Methods for Diophantine Equations (BIRS Workshop) (2006)
- *Isogenies on elliptic curves in short Weierstrass form*
Pacific North-West Number Theory Seminar (2004)

Conferences, Workshops, Special Programmes, etc. (* by invitation)

- * CMS Winter Meeting, Vancouver (2010, upcoming)
- * Arithmetic of Surfaces, Lorentz Center (2010, upcoming)
- * Approximation diophantienne et transcendance, Luminy (2010)
- * CNTA XI, Wolfville Nova Scotia (2010)
- * Diophantine Approximation and Analytic Number Theory, BIRS (2010)
- Arithmetic Dynamics Workshop, New York (2010)
- * Moduli Spaces of Dynamical Systems, Barbados (2010)
- * AMS Special Session on Arithmetic Dynamics, San Francisco (2010)
- * Winter CMS meeting, Windsor (2009)
- * Workshop on Experimentation in Number Theory, Fields Institute (2009)
- * Counting Points on Varieties, Lorentz Centre (2009)
- * Arithmetic of K3 Surfaces, Banff International Research Station (2008)
- * Thematic Program on Arithmetic Geometry, Fields Institute (2008)
- Canadian Number Theory Association Meeting X, Waterloo (2008)
- Second Canada-France Congress, Montréal (2008)
- * The uniform boundedness conjecture in arithmetic dynamics,
American Institute of Mathematics, Palo Alto California (2008)
- * Number Theory and Computability, ICMS Edinburgh (2007)
- * LMS funded visit to J. Cremona, G. Everest, and S. Siksek (2007)
- Canadian Number Theory Association Meeting IX, Vancouver (2006)
- Analytic Methods for Diophantine Equations,
Banff International Research Station (2006)
- Pacific North-West Number Theory Conference, Vancouver (2005)
- Trimester on Explicit Methods in Number Theory,
l'Institut Henri Poincaré, Paris (2004)
- Pacific North-West Number Theory Seminar, Corvallis OR (2004)
- West Coast Number Theory, Asilomar CA (2003)
- Conference in Honour of Professor H. C. Williams, Banff (2003)

Students supervised

- A. Huang (2010)
Undergraduate research co-op student in arithmetic dynamics
- T. Hui (2010)
Undergraduate research student in arithmetic dynamics
- T. Ahmed (2007)
Undergraduate Senior Thesis on elliptic curves in cryptography

Courses Taught (NB: I taught some of these multiple times)

- Fields and Galois Theory (PMATH 642/442, Waterloo)
- Algebraic Number Theory (PMATH 641/441, Waterloo)
- Elementary Number Theory (PMATH 340, Waterloo)
- Algebra (Advanced Level) (MATH 145, Waterloo)
- Linear Algebra for Engineers (MATH 115, Waterloo)
- Senior Thesis (supervised one student) (MAT 492, U of Toronto)
- Introduction to Number Theory (MAT 315, U of Toronto)
- Multivariable Calculus (MAT 232, U of Toronto)
- Calculus (2-term course) (MAT 137, U of Toronto)
- Matrix Algebra (MATH 221, UBC)
- Differential Calculus (for students with no previous calculus) (MATH 180, UBC)
- Linear Systems (MATH 152, UBC)
- Integral Calculus (MATH 101, UBC)
- Differential Calculus (MATH 100, UBC)
- Assorted TA positions (UBC, SFU)

References available Other references available upon request

- Michael A. Bennett, University of British Columbia
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- Joseph H. Silverman, Brown University
(401) 863-1124, joseph_silverman@brown.edu
- Matt Baker, Georgia Institute of Technology
(404) 894-6480, mbaker@math.gatech.edu
- Thomas J. Tucker, University of Rochester
(585) 275-4416, ttucker@math.rochester.edu
- David McKinnon, University of Waterloo (teaching or research reference)
(519) 888-4567 ext. 35560, dmckinnon@math.uwaterloo.ca
- Frank Zorzitto, University of Waterloo (teaching reference)
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