

Christelle Vincent

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Department of Mathematics and Statistics

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Appointments

Assistant Professor, University of Vermont	January 2016 onwards
Visiting Scholar, Télécom ParisTech	June 2016
Visiting Scholar, ICERM	Fall 2015
Lecturer, Stanford University	2012–2015

Grants

NSF individual grant DMS-1802323 (PI) <i>Applications to cryptography of the construction of curves from modular invariants</i>	2018–2022
Thomas Jefferson Fund of the FACE Foundation (Co-PI) <i>Effective constructions of genus 3 CM curves and applications to cryptography</i>	2018–2021

Publications

- M. Desgroseilliers, B. Larose, C. Malvenuto, C. Vincent, Some results on two conjectures of Schützenberger. *Canadian Mathematical Bulletin*, Vol. 53 (3), 2010, pp. 453–465.
- C. Vincent, Drinfeld modular forms modulo \mathfrak{p} . *Proceedings of the American Mathematical Society*, Vol. 138 (12), 2010, pp. 4217–4229.
- C. Vincent, On the trace and norm maps from $\Gamma_0(\mathfrak{p})$ to $\mathrm{GL}_2(A)$. *Journal of Number Theory*, Vol. 142, 2014, pp. 18–43.
- Appendix B for Z. Yun, Galois representations attached to moments of Kloosterman sums and conjectures of Evans. *Compositio Mathematica*, Vol. 151, 2015, pp. 68–120.
- C. Vincent, Weierstrass points on the Drinfeld modular curve $X_0(\mathfrak{p})$, *Research in the Mathematical Sciences*, Vol. 2 (10), 2015.
- I. Bouw, W. Ho, B. Malmskog, R. Scheidler, P. Srinivasan, C. Vincent, Zeta functions of a class of Artin-Schreier curves with many automorphisms. *Directions in Number Theory*, pp. 87–124, Association for Women in Mathematics Series, Vol. 3, Springer, 2016.
- J. S. Balakrishnan, S. Ionica, K. Lauter, C. Vincent, Constructing genus 3 hyperelliptic Jacobians with complex multiplication. *LMS Journal of Computation and Mathematics*, Vol. 19 (A), 2016, pp. 283–300.
- C. Vincent, A characterization of the $U(\Omega, m)$ sets of a hyperelliptic curve as Ω and m vary. *Advances in the Mathematical Sciences*, pp. 79–95, Association for Women in Mathematics Series, Vol. 15, Springer, 2018.
- S. Ionica, P. Kılıçer, K. Lauter, E. Lorenzo García, M. Massierer, A. Mânzăţeanu, C. Vincent, Modular invariants for genus 3 hyperelliptic curves. *Research in Number Theory*, Vol. 5 (1), 2019, 22 pp.
- Appendix for J.-C. Lario and A. Somoza, An inverse Jacobian algorithm for Picard curves, *Research in Number Theory*, Vol. 7 (2), 2021, 23 pp.
- A. Alvarado, A. Koutsianas, B. Malmskog, C. Rasmussen, C. Vincent, M. West, A robust implementation for solving the S -unit equation and several applications, to appear in *Arithmetic geometry, number theory, and computation*, a volume of the Simons Symposia series by Springer.
- T. Dupuy, K. Kedlaya, D. Roe, C. Vincent, Isogeny classes of abelian varieties over finite fields in the LMFDB, to appear in *Arithmetic geometry, number theory, and computation*, a volume of the Simons Symposia series by Springer.
- T. Dupuy, K. Kedlaya, D. Roe, C. Vincent, Counterexamples to a conjecture of Ahmadi and Shparlinski, to appear in *Experimental Mathematics*.

Graduate students

Garvin Gaston, MSc 2017, *Hilbert Class Fields of Imaginary Quadratic Fields and Reflex Fields of Certain Sextic CM Fields*
Marcus Elia, PhD 2021, *Loss of Precision in Implementations of the Toom-Cook Algorithm*

Honors theses advised

Rosie Steinberg, BA 2018, *Enumerating Curves of Genus 2 over Finite Fields*
Grace Brill, BS 2019, *Maximal Artin-Schreier Curves for Coding Theory*
Alec Critten, BS 2021, *Characterizing Insecure Error Distributions for Various RLWE Problems*

Teaching (at the University of Vermont)

MATH 019: Fundamentals of Calculus I	MATH 254: Topology
MATH 124: Linear Algebra	MATH 382: Seminar
MATH 255: Elementary Number Theory	MATH 395: Abstract Algebra III
MATH 259: Cryptography	MATH 395: Abstract Algebra IV
MATH 247: Complex Analysis	

Other Teaching Experience

Organizer and lecturer at the Summer Program for Inclusive Excellence in Mathematics Mini-course entitled Topology Done Quick	June 2021
Lecturer at the Governor's Institute of Vermont	June 2018
Invited lecturer at the Connecticut Summer School in Number Theory Mini-course on Function Field Arithmetic	May 2018

Service and Outreach

Professional service

Organizer, AMS Special Session on Rethinking Number Theory	June 2021–January 2022
Organizer of the Summer Program for Inclusive Excellence	February–June 2021
Organizer of the Rethinking Number Theory Workshop	July–October 2020
Organizer of the Connecticut Summer School in Number Theory	February–June 2020
Member of the program committee, Algorithmic Number Theory Symposium	February–July 2020
Project leader, Women in Sage	August 2019
Visiting advisor, Mathematical Research Communities Explicit Methods in Arithmetic Geometry in Characteristic p	June 2019
Member of the program committee, Algorithmic Number Theory Symposium	February–July 2018
Member of the scientific committee, Canadian Number Theory Association	February–July 2018
Organizer, Witt Vectors, Deformations, and Absolute Geometry Conference	January–July 2018
Organizer, Sage Days 87 workshop	January–July 2017
Organizer, Kummer Classes and Anabelian Geometry Conference	January–September 2016
Organizer, AMS Special Session on Number Theory and Cryptography	June 2015–January 2016

University service

Faculty advisor to the SGA club Math Club	September 2016–May 2018
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College service

Member of a Mathematics hiring committee	October 2019–February 2020
Member of a Computer Science hiring committee	September 2019–March 2020
Member of a Computer Science hiring committee	September 2017–March 2018

Departmental service

Member of the Undergraduate Curriculum committee	September 2017 onwards
Member of the Online/Hybrid teaching committee	September 2016–May 2020

Invited Conference and Seminar Talks

- Talk entitled *Post-quantum cryptography: What is it and why?*
Upstate Number Theory Conference October 2021
Plenary speaker
- Talk entitled *Computing hyperelliptic modular invariants from period matrices*
Session on Computational Number Theory August 2021
MAA MathFest
Special Session on Coding Theory, Cryptography, and Number Theory October 2020
Fall Southeastern Sectional Meeting of the AMS
Special Session on Algorithms, Experimentation, and Applications in Number Theory January 2020
Joint Mathematics Meetings
Arithmetic, Geometry, Cryptography and Coding Theory June 2019
Invited Session on Women in Numbers April 2019
AWM Research Symposium
Special Session on Special Values of L-functions and Arithmetic Invariants in Families April 2019
Spring Eastern Sectional Meeting of the AMS
Special Session on Number Theory, Arithmetic Geometry, and Computation January 2019
Joint Mathematics Meetings
- Talk entitled *Une banque de données sur les classes d'isogénie des variétés abéliennes sur les corps finis*
CMS Summer Meeting June 2021
Special session Amicale de théorie des nombres en hommage à Robert Langlands
- Talk entitled *On the distribution of joint shapes of number fields*
Quebec-Vermont Number Theory Seminar September 2020
Number Theory Seminar, University of Oregon June 2020
Number Theory Seminar, University of Illinois–Urbana-Champaign April 2020
Note: This talk was canceled due to COVID.
Number Theory Seminar, Arizona State University November 2018
Number Theory Seminar, CU Boulder November 2018
- Talk entitled *Constructing curves of genus 3 with CM Jacobians*
Front Range Number Theory Day September 2020
Plenary speaker
Modular Forms, Arithmetic, and Women in Mathematics November 2019
Plenary speaker
- Talk entitled *Sage and the L-functions and modular forms database*
AMS MRC on Explicit Methods in Arithmetic Geometry in Characteristic p June 2019
Plenary speaker
- Talk entitled *Cryptography, a hack, and a backdoor*
Debate Club talk on cryptography October 2018
- Talk entitled *A lightning-fast survey of post-quantum cryptography*
CTNT Research Conference May 2018
- Talk entitled *The number theory behind cryptography*
UVM Math Club April 2018
Undergraduate Seminar, Norwich University October 2017
Vermont Math Day April 2017
Spuyten Duyvil Undergraduate Mathematics Conference April 2016
Keynote address

Invited Conference and Seminar Talks (continued)

Talk entitled <i>Constructing hyperelliptic curves of genus 3 whose Jacobian has CM</i>	
Number Theory Seminar, University of Virginia	October 2017
Special Session on Computational Number Theory	August 2017
Applied Mathematics, Modeling and Computational Science Conference	
Special Session on Applied and Computational Algebra and Geometry	July 2017
Mathematical Congress of the Americas	
Number Theory Seminar, University of Georgia	April 2017
Number Theory Seminar, Tufts University	April 2017
Number Theory Seminar, University of Rochester	March 2017
Number Theory Seminar, University of Pennsylvania	March 2017
Talk entitled <i>Computing equations of hyperelliptic curves whose Jacobian has CM</i>	
Number Theory Seminar, Boston University	October 2017
Special Session on Algebraic Curves and their Applications	September 2017
Fall Southeastern Sectional Meeting of the AMS	
Special Session on Women in Sage	April 2017
AWM Research Symposium	
Five College Number Theory Seminar, Amherst	April 2017
Number Theory Seminar, University of Michigan	December 2016
Number Theory Seminar, MIT	October 2016
Séminaire du Laboratoire MIS	May 2016
Université de Picardie Jules Verne	
Séminaire de la Butte-aux-Cailles	May 2016
Télécom ParisTech	
Number Theory Seminar, Copenhagen University	May 2016
Number Theory Seminar, Bristol University	March 2016
Quebec-Vermont Number Theory Seminar	March 2016
Talk entitled <i>Towards computing the structure of algebras of Drinfeld modular forms</i>	
Groups, Geometry, and Actions	June 2017
University of Münster	
Talk entitled <i>Abel-Jacobi maps and Riemann points on hyperelliptic Riemann surfaces</i>	
Special Session on Discrete Structures in Number Theory	January 2017
Joint Mathematics Meetings	
Talk entitled <i>Curves with many automorphisms</i>	
AWM Workshop: Special Session on Number Theory	January 2017
Joint Mathematics Meetings	
Talk entitled <i>Weierstrass points on Drinfeld modular curves</i>	
Colloquium, American University	September 2016
Talk entitled <i>What is cryptography? How does it work?</i>	
UVM Math Club	February 2016