

- Employment**
- **University of Toronto**
Professor (2019–)
Associate Professor (2016–2019)
Assistant Professor (2011–2016)
 - **Institute for Advanced Study, Princeton**
Member (2010–2011)
 - **Northwestern University**
Boas Assistant Professor (2007–2010)
 - **Institut des Hautes Etudes Scientifiques (IHES), Paris**
Postdoctoral fellow (2006–2007)
- Education**
- **Harvard University** (2001–2006)
Ph.D., June 2006
Advisor: Richard Taylor
 - **Cambridge University (Gonville & Caius College)** (1997–2001)
Certificate of Advanced Study in Mathematics (Part III),
with Distinction, June 2001
B.A., Mathematics, June 2000
- Research Interests**
- Generalizations of Serre’s Conjecture, mod p and p -adic Langlands, Galois representations, automorphic forms, p -adic Hodge theory
- Publications**
- *Conjectures and results on modular representations of $GL_n(K)$ for a p -adic field K* , with C. Breuil, Y. Hu, S. Morra, and B. Schraen; 191 pages. Submitted (2021).
 - *Gelfand–Kirillov dimension and mod p cohomology for GL_2* , with C. Breuil, Y. Hu, S. Morra, and B. Schraen; 107 pages. Submitted (2020).
 - *On the existence of admissible supersingular representations of p -adic reductive groups*, with K. Koziol, M.-F. Vignéras (appendix by S.-W. Shin).
Forum Math. Sigma 8 (2020), e2, 73 pp.
 - *Towards the finite slope part for GL_n* , with C. Breuil.
Int. Math. Res. Not. IMRN 2020, no. 24, 7504–7550.
 - *Inverse Satake isomorphism and change of weight*, with N. Abe and M.-F. Vignéras; 59 pages. Submitted (2018).
 - *General Serre weight conjectures*, with T. Gee and D. Savitt;
J. Eur. Math. Soc. **20** (2018), no. 12, 2859–2949.
 - *On mod p local-global compatibility for GL_3 in the ordinary case*, with D. Le and S. Morra;

- Compos. Math. **153** (2017), no. 11, 2215–2286.
- *Potentially crystalline lifts of certain prescribed types*,
with T. Gee, T. Liu, and D. Savitt;
Documenta Math. **22** (2017), 397–422.
 - *A classification of irreducible admissible mod p representations of p -adic reductive groups*, with N. Abe, G. Henniart, and M.-F. Vignéras;
J. Amer. Math. Soc. **30** (2017), no. 2, 495–559.
 - *Adequate groups of low degree*, with R. Guralnick and P. H. Tiep;
Algebra Number Theory **9** (2015), no. 1, 77–147.
 - *Adequate groups and indecomposable modules*,
with R. Guralnick and P. H. Tiep;
J. Eur. Math. Soc. **19** (2017), no. 4, 1231–1291.
 - *Ordinary representations of $G(\mathbb{Q}_p)$ and fundamental algebraic representations*,
with C. Breuil;
Duke Math. J. **164** (2015), no. 7, 1271–1352.
 - *Weight cycling and Serre-type conjectures for unitary groups*,
with M. Emerton and T. Gee;
Duke Math. J. **162** (2013), no. 9, 1649–1722.
 - *Adequate subgroups*, with R. Guralnick, R. Taylor, and J. Thorne;
Appendix to *On the automorphy of l -adic Galois representations
with small residual image* by J. Thorne;
J. Inst. Math. Jussieu **11** (2012), no. 4, 907–920.
 - *The classification of irreducible admissible mod p representations of a
 p -adic GL_n* ;
Invent. Math. **186** (2011), no. 2, 373–434.
 - *A Satake isomorphism in characteristic p* ;
Compos. Math. **147** (2011), no. 1, 263–283.
 - *Conjecture de type de Serre et formes compagnons pour GSp_4* ,
with J. Tilouine.
J. Reine Angew. Math. (Crelle) **676** (2013), 1–32.
 - *The weight in a Serre-type conjecture for tame n -dimensional Galois
representations*;
Duke Math. J. **149** (2009), no. 1, 37–116.
- Papers available at <http://www.math.toronto.edu/~herzig/>.

**Grants
& Awards**

- **NSERC Discovery Grant (2018–2023)**, \$41,000 p.a.
- **Simons Fellow in Mathematics (2017–2018)**
- **Ribenboim Prize (2014)**

- **Province of Ontario Early Researcher Award (2014–2019)**, \$100,000
- **Alfred P. Sloan Research Fellowship (2012–2016)**
- **Connaught New Researcher Award (2012–2014)**, \$10,000
- **NSERC Discovery Grant (2012–2018)**, \$30,000 p.a.
- **NSERC Discovery Grant (2011–2012)**, \$18,000
- **NSF Grant DMS-0902044 (2009–2012)**, \$90,549
- **Clay Liftoff Fellowship (2006)**
- **International Mathematical Olympiad (1994–1997)**
Bronze medal (1995), silver medal (1996), gold medal (1997).

Professional Activities

- **Organizer**, Conference on Serre weights conjectures and geometry of Shimura varieties, CRM Montreal, Fall 2020 (with E. de Shalit, F. Diamond, E. Goren, E. Mantovan)
- **Organizer**, Fields Institute Thematic Semester Program on Unlikely Intersections, Heights, and Efficient Congruencing, Spring 2017 (with J. Friedlander, Y.-R. Liu, J. Pila, J. Tsimerman, T. Wooley)
- **Organizer**, Fields Medal Symposium in honour of Manjul Bhargava, Fields Institute, November 2016 (with I. Daubechies, J. Friedlander, K. Murty, S. Ramdorai, J. Tsimerman)
- **Organizer**, MSRI Semester Program on Geometric Representation Theory, Fall 2014 (with D. Ben-Zvi, T. Haines, K. McGerty, D. Nadler, B.C. Ngo, C. Stropfel, E. Viehmann)
- **Organizer**, MSRI Workshop on Categorical Structures in Harmonic Analysis, November 2014 (with T. Haines and D. Nadler)
- **Organizer**, Workshop on Modular Representation Theory Related to the Langlands Program, IMS Singapore, April 2013 (with W.T. Gan, A. Minguez)
- **Co-organizer**, University of Toronto Number Theory / Representation Theory Seminar, 2012–
- **Organizer**, Workshop on the p -adic Langlands Program at the Fields Institute, April 2012 (with C. Breuil, T. Gee, J. Nekovář)
- **Organizer**, Fields Institute Thematic Semester Program on Galois Representations, Spring 2012 (with F. Calegari, M. Emerton, M. Kisin, S. Kudla)
- **Organizer**, Northwestern Number Theory Seminar, 2008–2010

Visits

- **Université Paris 11**
Maître de conférences invité (June 2015), 1 month
- **MSRI**

Simons Visiting Professor and Eisenbud Professor (Fall 2014)

- **Université Paris 11**
Maître de conférences invité (June 2014), 1 month
- **IHES**
Visitor (June/July 2012), 1 month
- **Université Paris 11**
Maître de conférences invité (May 2011), 1 month
- **Université Paris 7 – Denis Diderot**
Maître de conférences invité (July 2008), 1 month
- **Max-Planck-Institut für Mathematik, Bonn**
Guest (July/August 2006), 1 month

Teaching**University of Toronto**

- MAT 475 (Problem Solving Seminar), Fall 2021
- MAT 1101 (Graduate Algebra II), Spring 2022
- MAT 475 (Problem Solving Seminar), Fall 2020
- MAT 1100 (Graduate Algebra I), Fall 2020
- MAT 347 (Groups, Rings, and Fields), Fall 2019/Spring 2020
- MAT 1100 (Graduate Algebra I), Fall 2019
- MAT 347 (Groups, Rings, and Fields), Fall 2018/Spring 2019
- MAT 1200/415 (Algebraic Number Theory), Fall 2018
- MAT 1110 (Linear Algebraic Groups), Spring 2017
- MAT 247 (Algebra II), Spring 2017
- MAT 1100 (Graduate Algebra I), Fall 2016
- MAT 224 (Linear Algebra II), Spring 2016
- MAT 1100 (Graduate Algebra I), Fall 2015
- MAT 1210 (Arithmetic of Elliptic Curves), Spring 2015
- MAT 1200/415 (Algebraic Number Theory), Spring 2014
- MAT 135 (Calculus I(A)), Fall 2013
- MAT 1110 (Linear Algebraic Groups), Spring 2013
- MAT 327 (Introduction to Topology), Fall 2012
- MAT 1104 (Mod p Representation Theory of p -adic Groups), Spring 2012
- MAT 327 (Introduction to Topology), Fall 2011

Northwestern University

- Math 230 (Multivariable Calculus), Spring 2010

- Math 470-3 (Graduate Algebra III), Spring 2010
- Math 220 (Single Variable Calculus I), Fall 2009
- Math 470-1 (Graduate Algebra I), Fall 2009
- Math 224 (Single Variable Calculus II), Winter 2009
- Math 330-2 (Abstract Algebra II), Winter 2009
- Math 220 (Single Variable Calculus I), Fall 2008
- Math 330-1 (Abstract Algebra I), Fall 2008
- Math 224 (Single Variable Calculus II), 2 sections, Winter 2008
- Math 220 (Single Variable Calculus I), 2 sections, Fall 2007

Harvard University

- QR 28 (“The Magic of Numbers”), Head Teaching Fellow, Fall 2005;
Awarded the *Certificate of Distinction in Teaching* by the Derek Bok Center,
based on student evaluations.
- QR 28 (“The Magic of Numbers”), Course Assistant, Spring 2005;
Awarded the *Certificate of Distinction in Teaching* by the Derek Bok Center,
based on student evaluations.
- Math 1b (Single Variable Calculus II), Teaching Fellow, Fall 2003
- Math 1a (Single Variable Calculus I), Teaching Fellow, Fall 2002
- Quals Tutor, Fall 2003–Spring 2006; Assisting first-year graduate students in
preparing for the written qualifying exams.

Students

- Rudy Ariaz (reading course on modular forms), Fall 2021
- Rudy Ariaz (summer workstudy program), Summer 2021
- Elnaz Hessami Pilehrood (reading course on rep. theory), Summer 2020
- Adrian Carpenter, Summer 2019 (USRA)
- Rena Chu, Summer 2019 (USRA co-supervision)
- Jonathan Fischer (Master’s project), Summer 2019
- Heejong Lee, Ph.D., 2019–present
- Heejong Lee (summer research project), Summer 2019
- Heejong Lee (reading course on modular forms, etc.), Spring 2019
- Ali Cheraghi (reading course on p -adic Hodge theory), Spring 2019
- Roy Magen, Summer 2016, Summer 2017 (USRA)
- John Enns, Ph.D., 2015–2018
- John Enns (reading course on modular forms, etc.), Spring 2015
- John Enns (Master’s project), Summer 2014
- Elliot Cheung, Summer 2014 (USRA)

- Chiara Moraglia (Master's, reading course), Fall 2013
- Vincent Gélinas (Master's project), Summer 2013
- Faisal Al-Faisal, Fall 2012–Spring 2013
- Diego Izquierdo (Mémoire Master 2 for ENS Paris), Fall 2012
- Jack Klys (Master's project), Summer 2012
- Joshua Seaton, Summer 2012 (USRA), Summer 2013, Spring 2014
- Peter Martin (senior honors thesis), Northwestern, 2008–2009

Postdocs

- Zicheng Qian, 2019–2022
- E. Knight, 2017–2020
- Daniel Le (NSF postdoc from 2017), 2015–2016, 2017–2020
- Karol Koziol (NSF postdoc), 2014–2015, 2016–2018
- Chol Park, 2013–2014
- Stefano Morra (Fields-Ontario PDF), Jan. 2012–Dec. 2012, July 2013–June 2014

Service

- **Associate Editor:** Journal of the Ramanujan Mathematical Society (2016–)
- **Departmental service:** Teaching Assignment Coordinator (2018–2021), Colloquium Committee (2011–2012), Undergraduate Committee (2016–2017, 2018–2022), Workload committee (2019–2020, 2021–2022), Graduate Committee (2012–2013, 2015–2017, 2019–2020), Library Committee (2012–2013), Department Council (2012–2014), Appointments Committee (2013–2014), Graduate Appeals Committee (2014–2017), Outreach Committee (2014–2016)
- **Putnam training sessions**, Northwestern (2007–2009); Toronto (2011–)
- **Referee:** reports written for Algebra Number Theory, American Journal of Mathematics, Annales Scientifiques de l'École Normale Supérieure, Compositio Mathematica, Duke Mathematical Journal, Forum of Mathematics Pi and Sigma, Journal für die Reine und Angewandte Mathematik (Crelle), Publications Mathématiques de l'IHÉS, etc.
- **Reviewer** of grant proposals for NSA and NSERC.
- **External reviewer** of Ph.D. theses at University of Paris 7 (2013), University of Paris 11 (2014, 2020).

Outreach

- Presentation to two grade 7 classes, University of Toronto, June 2017
- Presentation to a grade 5/6 class, University of Toronto, February 2016
- Presentation to a grade 7/8 class, University of Toronto, February 2015

**Invited Talks
(Conferences)**

- Canadian Mathematical Society Summer Meeting; Ottawa, June 2021

- International Colloquium on Arithmetic Geometry; TIFR, Mumbai, January 2020
- The p -adic Langlands programme and related topics; King's College London, May 2019
- Canadian Mathematical Society Winter Meeting; Vancouver, December 2018 (*plenary talk*)
- Arithmetic Geometry and Related Topics; Matsuyama (Japan), November 2017
- Galois Representations and Automorphic Forms; Bedlewo (Poland), August 2016
- The p -adic Langlands Program and Related Topics; Indiana University Bloomington, May 2016
- Canadian Mathematical Society Winter Meeting; Montreal, December 2015
- Arithmetic geometry, representation theory and applications; Luminy (France), June 2015
- Frontiers in Serre's Modularity Conjecture: Torsion and Low Weights; Luxembourg, June 2015
- Arithmétique des variétés de Shimura et des formes automorphes et Applications; Luminy (France), July 2014
- 13th Conference of the Canadian Number Theory Association (CNTA XIII), Ottawa, June 2014 (Ribenoim Prize lecture)
- Fourth Annual Upstate Number Theory Conference; Buffalo, April 2014
- Représentations des groupes réductifs p -adiques et applications (in honour of Guy Henniart); Luminy (France), January 2014
- Montreal-Toronto Workshop in Number Theory; Toronto, November 2013
- Géométrie Arithmétique p -adique; Lyon (France), June 2013
- Workshop on the Serre conjecture; Bonn (Germany), February 2013
- Iwasawa Theory, Representations, and the p -adic Langlands program (in honour of Peter Schneider's 60th birthday); Münster (Germany), January 2013
- Workshop on the Arithmetic Geometry of Shimura Varieties, Representation Theory, and Related Topics; Sapporo (Japan), July 2012 (*two talks*)
- Automorphic forms and Galois representations; Paris 13, June 2012
- Galois Representations, Shimura Varieties, and Automorphic Forms (workshop for graduate students and postdocs); Fields Institute, March 2012 (*expository talk*)
- Automorphic forms, Galois representations, and geometric representation theory; Córdoba (Argentina), August 2011
- Double affine Hecke algebras, the Langlands program, affine flag varieties, con-

- formal field theory, super Yang-Mills theory; Luminy (France), June 2011
- Algebraische Zahlentheorie; Oberwolfach (Germany), June 2011
- Workshop on Arithmetic Geometry and Related Topics; Taipei (Taiwan), July 2010
- Workshop on Automorphic Representations, Geometry, and Arithmetic; Taipei (Taiwan), July 2009
- Formes Modulaires, Théorie de Hodge p -adique et Applications; Roscoff (France), July 2009
- Minerva School on p -adic Methods in Arithmetic Algebraic Geometry; Jerusalem (Israel), March/April 2009
- Workshop on Shimura Varieties, Automorphic Representations and Related Topics; Kyoto (Japan), November 2008 (*two talks*)
- p -adic Representations of p -adic Groups; Paris (France), July 2008
- Instructional Conference on Representation Theory and Arithmetic; Northwestern, May 2008 (*expository talk*)
- Recent Developments in Number Theory; UCLA, March 2008
- Summer School on Serre's Modularity Conjecture; Luminy (France), July 2007 (*expository talk*)
- First Joint International Meeting between the AMS and the Polish Mathematical Society; Warsaw (Poland), July/August 2007
- Lie Theory, Geometry and Representations Conference (Journées Solstice d'Été); Paris (France), June 2007

**Invited
Minicourses**

- Spring School towards a mod p Langlands correspondence, Essen (Germany)/virtual, April 2021
- Padova school on Serre conjectures and the p -adic Langlands program, May/June 2019
- Beijing International Center for Mathematical Research, April 2015
- Modular Representation Theory of Finite and p -adic Groups, IMS Singapore, April 2013
- Galois Trimester, IHP (Paris), January 2010
- p -adic Representations of p -adic Groups; Paris (France), July 2008 (*joint with M. Emerton*)

**Invited Talks
(Seminars)**

- Rutgers Colloquium, Fall 2019
- Harvard Number Theory Seminar, November 2018
- Duisburg–Essen Arithmetic Geometry Seminar, April 2018

- Séminaire Arithmétique et Géométrie Algébrique, Paris 11, April 2018
- Séminaires de Géométrie Arithmétique et Motivique, Paris 13, February 2018
- Séminaire d'algèbre et de théorie des nombres, École Polytechnique, December 2017
- London Number Theory Seminar at Imperial College, December 2017
- Cambridge University Number Theory Seminar, December 2017
- Séminaire Groupes Réductifs et Formes Automorphes, Paris 6/7, November 2017
- UBC Number Theory Seminar, May 2017
- University of Vienna Colloquium, May 2017
- Séminaires de Géométrie Arithmétique et Motivique, Paris 13, June 2016
- Johns Hopkins Number Theory Seminar, February 2016
- University of Chicago Number Theory Seminar, November 2015
- Northwestern Number Theory Seminar, November 2015
- JHU-UMD Algebra and Number Theory Day, College Park, November 2015
- Morningside Center of Mathematics, Beijing, April 2015
- McMaster Arithmetic Geometry Seminar, April 2015
- 8th Bay Area Algebraic Number Theory and Arithmetic Geometry Day, Berkeley, November 2014
- Séminaire Arithmétique et Géométrie Algébrique, Paris 11, June 2014
- Rennes Séminaire de Géométrie Algébrique, June 2014
- Purdue Automorphic Forms Seminar, April 2014
- BC-MIT Number Theory Seminar, February 2014
- Boston University Number Theory Seminar, February 2014
- UCSD Number Theory Seminar, December 2013
- Waterloo Colloquium, September 2013
- Séminaire Groupes Réductifs et Formes Automorphes, Paris 6/7, June 2013
- McMaster Arithmetic Geometry Seminar, March 2013
- University of Chicago Number Theory Seminar, November 2012
- Northwestern Number Theory Seminar, November 2012
- Johns Hopkins Algebraic Geometry & Number Theory Seminar, November 2012
- University of Arizona Algebra/Number Theory Seminar, October 2012
- Korea Institute for Advanced Study, Seoul, July 2012
- Séminaire Arithmétique et Géométrie Algébrique, Paris 11, June 2012
- Stanford/AIM Number Theory Seminar, May 2012

- Québec–Vermont Number Theory Seminar, April 2012
- Princeton/IAS Number Theory Seminar, December 2011
- Indiana University Algebra Seminar, November 2011
- Séminaire Groupes Réductifs et Formes Automorphes, Paris 6/7, May 2011
- Study group “Automorphie potentielle des systèmes compatibles de représentations galoisiennes”, Paris 13, May 2011
- Séminaire Arithmétique et Géométrie Algébrique, Paris 11, May 2011
- Princeton Colloquium, February 2011
- Temple Colloquium, February 2011
- IAS Galois Representations and Automorphic Forms Seminar, October 2010
- Boston University Number Theory Seminar, October 2010
- Penn Algebra Seminar, October 2010
- Wisconsin Number Theory Seminar, April 2010
- University of Chicago Number Theory Seminar, March 2010
- Caltech Number Theory Seminar, February 2010
- Michigan Group Theory/Lie Theory/Number Theory Seminar, February 2010
- Yale Colloquium, February 2010
- UIUC Colloquium, January 2010
- Austin Algebra, Number Theory, and Combinatorics Seminar, January 2010
- UBC Colloquium and Algebraic Groups/Number Theory Seminar, January 2010
- Toronto Colloquium, January 2010
- Bonn Gastvortrag, December 2009
- Münster Gastvortrag, December 2009
- Boston College Colloquium, December 2009
- UIC Colloquium, December 2009
- Utah Colloquium and Representation Theory Seminar, December 2009
- Rice Colloquium, November 2009
- Maryland Representation Theory Seminar, November 2009
- UCLA Number Theory Seminar, May 2009
- Purdue Automorphic Forms Seminar, May 2009
- McMaster Arithmetic Geometry Seminar, April 2009
- Toronto Number Theory/Representation Theory Seminar, April 2009
- Québec–Vermont Number Theory Seminar at McGill, March 2009
- Princeton/IAS Number Theory Seminar, November 2008
- Harvard Number Theory Seminar, September 2008

- UIC Number Theory/Arithmetic Geometry Seminar, February 2008
- Séminaire Arithmétique et Géométrie Algébrique, Paris 11, June 2007
- IHES (Paris), June 2007
- Joint ENS–IHES Study Group on Generalizations of Serre’s Conjecture (Paris), April 2007
- Cambridge University Number Theory Seminar, February 2007
- Séminaire Arithmétique et Géométrie Algébrique, Strasbourg, January 2007
- Joint ENS–IHES Study Group on Generalizations of Serre’s Conjecture (Paris), January 2007
- Essen Oberseminar, December 2006
- Bielefeld Oberseminar Algebra und Geometrie, December 2006
- Joint London–Paris Number Theory Seminar, IHP (Paris), November 2006
- Ohio State Arithmetic Geometry Seminar, June 2006
- Boston College Number Theory Seminar, May 2006
- Michigan Arithmetic Seminar, January 2006
- Northwestern Special Seminar, January 2006
- Brandeis Fellowship of the Ring Seminar, November 2005
- Harvard Number Theory Seminar, April 2005
- Richard Taylor’s Seminar at Harvard, *Modular Representations of Chevalley Groups*, April–May 2005 (a series of eight one-hour talks)

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Personal

Austrian citizen, Canadian Permanent Resident