Valentin Huguin | Postdoctoral fellow in mathematics

University of Toronto

✉ valentin.huguin@utoronto.ca • 🌐 https://vhuguin.com/
French national, born on November 17, 1994.

Academic career

Employment

Walter Craig Postdoctoral Fellow

University of Toronto — 2023–2025
- Supervisor: Michael Yampolsky.

Postdoctoral fellow in mathematics

Constructor University (formerly Jacobs University Bremen) — 2021–2023
- Supervisor: Igors Gorbovickis.

Education

Ph.D. in mathematics

Institut de Mathématiques de Toulouse (Université Paul Sabatier) — 2018–2021
- Title: *Algebraic study of the periodic points and multipliers of a rational map*,
- Advisors: Xavier Buff and Jasmin Raissy,
- Referees: Laura DeMarco and Charles Favre,
- Examiners: Arnaud Chéritat, Thomas Gauthier, Rafe Jones, Sarah Koch.

Master's degree in mathematics – second year

Université Paul Sabatier and École Normale Supérieure de Rennes, with honors — 2017–2018

Four-month research internship at Institut de Mathématiques de Toulouse (Université Paul Sabatier):
- Title: *Preperiodic points and unlikely intersections*,
- Advisors: Xavier Buff and Jasmin Raissy.

Preparation to the agrégation of mathematics

Université de Rennes 1 and École Normale Supérieure de Rennes, with high honors — 2016–2017

The agrégation is a competitive examination for civil service in the French public education system, Ranked 11th nationally.

Master's degree in mathematics – first year

Université de Rennes 1 and École Normale Supérieure de Rennes, with high honors — 2015–2016

Six-week research internship at School of Mathematical Sciences (University of Nottingham):
- Title: *The escaping set in complex dynamics*,
- Advisor: Daniel A. Nicks.

Bachelor's degree in mathematics

Université de Rennes 1 and École Normale Supérieure de Rennes, with high honors — 2014–2015

Five-week research internship at Laboratoire de Mathématiques d'Orsay (Université Paris-Sud):
- Title: *Concentration-compactness principle and applications*,
- Advisor: Frédéric Rousset.

Research

Research interests

Holomorphic dynamics, algebraic dynamics, arithmetic dynamics.

Articles

Moduli spaces of polynomial maps and multipliers at small cycles: arXiv:2412.19335, 2024.

Entire maps with rational preperiodic points and multipliers (with X. Buff and I. Gorbovickis): To appear in Ergodic Theory and Dynamical Systems, arXiv:2304.13674, 2023.

Entire or rational maps with integer multipliers (with X. Buff, T. Gauthier and J. Raissy): To appear in the proceedings of the Simons Symposia on Algebraic, Complex, and Arithmetic Dynamics, arXiv:2212.03661, 2023.

Rational maps with rational multipliers: J. Éc. polytech. Math. **10** (2023), 591–599.

Quadratic rational maps with integer multipliers: Math. Z. **302** (2022), no. 2, 949–969.

Unicritical polynomial maps with rational multipliers: Conform. Geom. Dyn. **25** (2021), 79–87.

Simultaneously preperiodic integers for quadratic polynomials: New York J. Math. **27** (2021), 363–378.

Other works

Étude algébrique des points périodiques et des multiplicateurs d'une fraction rationnelle: Ph.D. thesis, https://tel.archives-ouvertes.fr/tel-03466529, 2021.

Research mini-courses

Series of three lectures
Entire or rational maps with integer or rational multipliers   *October 2023*
Department of Mathematics (University of Toronto)

Research talks

Dynamics Seminar
Moduli spaces of polynomial maps and multipliers at small cycles   *February 2025*
Department of Mathematics (University of Toronto)

Séminaire Analyse
Around the multiplier spectrum in complex dynamics   *January 2025*
Institut de Recherche Mathématique Avancée (Université de Strasbourg)

Arithmetic, Algebraic and Analytic Dynamics
Moduli spaces of polynomial maps and multipliers at small cycles   *January 2025*
Centre International de Rencontres Mathématiques (Marseille)

Séminaire SymPa
Moduli spaces of polynomial maps and multipliers at small cycles   *January 2025*
Laboratoire Amiénois de Mathématique Fondamentale et Appliquée (Université de Picardie Jules Verne)

Dynamics Seminar
Moduli spaces of polynomial maps and multipliers at small cycles   *December 2024*
Department of Mathematics (Cornell University)

Mini-symposium Holomorphic Dynamics (as part of the conference XLIV Dynamics Days Europe)
Moduli spaces of polynomial maps and multipliers at small cycles   *July 2024*
Constructor University (Bremen)

Dynamics Seminar
Entire or rational maps with integer or rational multipliers *September 2023*
Department of Mathematics (University of Toronto)

7th Hanseatic Dynamical Systems Day
Rational maps with rational multipliers *June 2023*
Fachbereich Mathematik (Universität Hamburg)

Séminaire Orléans
Rational maps with rational multipliers *June 2023*
Institut Denis Poisson (Université d'Orléans)

Length spectrum of rational maps
Rational maps with integer or rational multipliers *October 2022*
Centre de Mathématiques Laurent Schwartz (École polytechnique)

New Trends in Holomorphic Dynamics
Dynamics of Koch postcritically finite endomorphisms *August 2022*
Palazonne di Cortona

Journées ANR Fatou
Dynamics of Koch postcritically finite endomorphisms *June 2022*
Institut Denis Poisson (Université d'Orléans)

Séminaire Dynamique et Probabilités
Quadratic rational maps with integer multipliers *May 2021*
Laboratoire Amiénois de Mathématique Fondamentale et Appliquée (Université de Picardie Jules Verne)

Arithmetic Dynamics International Online Seminar
Unicritical polynomial maps with rational multipliers *April 2021*

Séminaire de systèmes dynamiques
Unicritical polynomial maps with rational multipliers *February 2021*
Institut de Mathématiques de Toulouse (Université Paul Sabatier)

Dynamics and Group Geometry Early Researchers Seminar
Unicritical polynomial maps with rational multipliers *December 2020*
Mathematics Institute (University of Warwick)

Topics in Complex Dynamics 2019
Simultaneously preperiodic integers for quadratic polynomials *March 2019*
Institut de Matemàtica (Universitat de Barcelona)

Séminaire de systèmes dynamiques
Simultaneously preperiodic integers for quadratic polynomials *March 2019*
Institut de Mathématiques de Toulouse (Université Paul Sabatier)

Postgraduate Conference in Complex Dynamics 2019
Simultaneously preperiodic integers for quadratic polynomials *February 2019*
De Morgan House (London)

Teaching experience

Supervision

Three-month internship of Adrien Kachkachi
Some equidistribution problems in holomorphic dynamics *2022*
Third-year undergraduate student at Université Paul Sabatier

Courses taught

2024–2025, University of Toronto Mississauga:

- *Complex Variables* (*third-year course*), Lectures and coordination.
- *Introduction to Mathematical Proofs* (*first-year course*), Lectures.

2023–2024, University of Toronto Mississauga:
- *Complex Variables* (*third-year course*), Lectures and coordination.
- *Differential Equations I* (*second-year course*), Lectures and coordination.

2020–2021, Université Paul Sabatier:
- *Mathematics* (*first-year course*), Tutorial sessions.
- *Topology* (*third-year course*), Oral examinations.
- *Algebra* (*first-year course*), Practical sessions in the computer laboratory.
- *Analysis* (*first-year course*), Practical sessions in the computer laboratory.
- *Algebra 6* (*third-year course*), Oral examinations.

2019–2020, Université Paul Sabatier:
- *Mathematics* (*first-year course*), Tutorial sessions.
- *Topology* (*third-year course*), Oral examinations.
- *Algebra* (*first-year course*), Practical sessions in the computer laboratory.
- *Analysis* (*first-year course*), Practical sessions in the computer laboratory.

2018–2019, Université Paul Sabatier:
- *Mathematics* (*first-year course*), Tutorial sessions.
- *Analysis* (*first-year course*), Lectures and tutorial sessions.

Service

Organization of scientific events

Mini-symposium Holomorphic Dynamics (as part of the conference XLIV Dynamics Days Europe) (with T. Firsova and I. Gorbovickis)
Constructor University (*Bremen*)   *July 2024*

Refereeing activities

Review of research articles for the following journals:
- Ergodic Theory and Dynamical Systems,
- Arnold Mathematical Journal.

Skills

Languages: French (native), English (fluent).

Computer skills: LaTeX, Python, SageMath, HTML, CSS, Magma, Scilab.