

Valentin Huguin | Postdoctoral fellow in mathematics

University of Toronto Mississauga

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French national, born on November 17, 1994.

Academic career

Employment

Postdoctoral fellow in mathematics

Department of Mathematical and Computational Sciences (University of Toronto Mississauga) 2023–

- Name of the position: Walter Craig Postdoctoral Fellow,
- Supervisor: Michael Yampolsky.

Postdoctoral fellow in mathematics

School of Science (Constructor University, formerly Jacobs University) 2021–2023

- Project: *Rigidity problems, renormalization and critical points of the multiplier maps,*
- 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.

Classes préparatoires aux grandes écoles, MPSI-MP*

Lycée Chateaubriand (Rennes)

2012–2014

Two-year undergraduate intensive program with specialization in mathematics and physics.

Research

Research interests.....

Holomorphic dynamics, arithmetic dynamics, Thurston theory, pluripotential theory.

Articles.....

Entire maps with rational preperiodic points and multipliers (with X. Buff and I. Gorbovickis): 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.

Uncritical 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 talks.....

Dynamics Seminar

Entire or rational maps with integer or rational multipliers
Department of Mathematics (University of Toronto)

September 2023

7th Hanseatic Dynamical Systems Day

Rational maps with rational multipliers
Fachbereich Mathematik (Universität Hamburg)

June 2023

Séminaire Orléans

Rational maps with rational multipliers
Institut Denis Poisson (Université d’Orléans)

June 2023

New Trends in Holomorphic Dynamics

Dynamics of Koch postcritically finite endomorphisms
Palazzone di Cortona

August 2022

Journées ANR Fatou

Dynamics of Koch postcritically finite endomorphisms
Institut Denis Poisson (Université d’Orléans)

June 2022

Séminaire Dynamique et Probabilités

Quadratic rational maps with integer multipliers
Laboratoire Amiénois de Mathématique Fondamentale et Appliquée (Université de Picardie Jules Verne)

May 2021

Arithmetic Dynamics International Online Seminar

Uncritical polynomial maps with rational multipliers

April 2021

Séminaire de systèmes dynamiques <i>Unicritical polynomial maps with rational multipliers</i> Institut de Mathématiques de Toulouse (Université Paul Sabatier)	February 2021
Dynamics and Group Geometry Early Researchers Seminar <i>Unicritical polynomial maps with rational multipliers</i> Mathematics Institute (University of Warwick)	December 2020
Topics in Complex Dynamics 2019 <i>Simultaneously preperiodic integers for quadratic polynomials</i> Institut de Matemàtica (Universitat de Barcelona)	March 2019
Séminaire de systèmes dynamiques <i>Simultaneously preperiodic integers for quadratic polynomials</i> Institut de Mathématiques de Toulouse (Université Paul Sabatier)	March 2019
Postgraduate Conference in Complex Dynamics 2019 <i>Simultaneously preperiodic integers for quadratic polynomials</i> De Morgan House (London)	February 2019
Conferences attended	
XLIV Dynamics Days Europe <i>Constructor University (Bremen)</i>	July 2024
Inaugural CNAM-Fields Nonlinear Days: Renormalization and Friends <i>Fields Institute for Research in Mathematical Sciences (Toronto)</i>	August 2023
7th Hanseatic Dynamical Systems Day <i>Fachbereich Mathematik (Universität Hamburg)</i>	June 2023
New Trends in Holomorphic Dynamics <i>Palazzone di Cortona</i>	August 2022
Journées ANR Fatou <i>Institut Denis Poisson (Université d'Orléans)</i>	June 2022
Adventurous Berkeley Complex Dynamics <i>Mathematical Sciences Research Institute (Berkeley)</i>	May 2022
Advancing Bridges in Complex Dynamics <i>Centre International de Rencontres Mathématiques (Marseille)</i>	September 2021
Topics in Complex Dynamics 2021 <i>Institut de Matemàtica (Universitat de Barcelona)</i>	April 2021
Complex Dynamics <i>Centre International de Rencontres Mathématiques (Marseille)</i>	January 2020
Rencontre de l'ANR Fatou <i>Institut Denis Poisson (Université d'Orléans)</i>	November 2019
Topics in Complex Dynamics 2019 <i>Institut de Matemàtica (Universitat de Barcelona)</i>	March 2019
Postgraduate Conference in Complex Dynamics 2019 <i>De Morgan House (London)</i>	February 2019
Conférence finale de l'ANR LAMBDA <i>Institut de Mathématiques de Toulouse (Université Paul Sabatier)</i>	May 2018

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.....

2023–2024:

- *Complex Variables (third-year course)*, Lectures, University of Toronto Mississauga, 36 hours.
- *Differential Equations I (second-year course)*, Lectures, University of Toronto Mississauga, 36 hours.

2020–2021:

- *Mathematics (first-year course)*, Exercise sessions, Université Paul Sabatier, 30 hours.
- *Topology (third-year course)*, Oral examinations, Université Paul Sabatier, 4 hours.
- *Algebra (first-year course)*, Exercise sessions with Python, Université Paul Sabatier, 18 hours.
- *Analysis (first-year course)*, Exercise sessions with Python, Université Paul Sabatier, 18 hours.
- *Algebra 6 (third-year course)*, Oral examinations, Université Paul Sabatier, 1 hour.

2019–2020:

- *Mathematics (first-year course)*, Exercise sessions, Université Paul Sabatier, 30 hours.
- *Topology (third-year course)*, Oral examinations, Université Paul Sabatier, 2 hours.
- *Algebra (first-year course)*, Exercise sessions with Python, Université Paul Sabatier, 18 hours.
- *Analysis (first-year course)*, Exercise sessions with Python, Université Paul Sabatier, 18 hours.

2018–2019:

- *Mathematics (first-year course)*, Exercise sessions, Université Paul Sabatier, 30 hours.
- *Analysis (first-year course)*, Lectures and exercise sessions, Université Paul Sabatier, 26 hours.

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

Skills

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

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