Christopher Lazda

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Research Interests

I am interested in arithmetic geometry in general, and in p-adic cohomology and homotopy theory in particular. Much of my work has concentrated on the study of p-adic homotopical invariants of varieties in characteristic $p > 0$, and in using these as tools to approach arithmetic questions.

Employment

Sep 2017 – Present **Post-Doctoral Researcher**, *KdVI Universiteit van Amsterdam*, Netherlands.

Nov 2015 – Aug 2017 **Marie Curie INdAM Fellow**, *Università Degli Studi di Padova*, Italy.

Oct 2014 – Oct 2015 **HIMR Research Fellow**, *Imperial College London*, UK.

Apr – Oct 2014 **EPSRC Doctoral Prize Fellow**, *Imperial College London*, UK.

Education

Oct 2010 – Mar 2014 **Ph.D.**, *Imperial College London*, UK.
Thesis title: *Rational homotopy theory in arithmetic geometry, applications to rational points.*
Advisor: Dr. A. Pál.

Oct 2009 – Jun 2010 **C.A.S.M./M.Math.**, *University of Cambridge*, UK, Distinction.
Thesis title: *2-Descent on the Jacobians of Hyperelliptic Curves.*
Advisor: Dr. T. Fisher.

Oct 2006 – Jun 2009 **B.A.**, *University of Cambridge*, UK, 1st Class (Hons).

Grants

2017 **LMS**, Funding for workshop “Interactions between Arithmetic and Homotopy Theory”, £2,500.

2016 **HIMR**, Funding for workshop “Interactions between Arithmetic and Homotopy Theory”, £5,000.

2015 **BIRS**, Funding for Banff workshop “p-adic cohomology and arithmetic applications”.

2015 **INdAM**, Marie Curie INdAM Fellowship (PI), €101,700.

2014 **EPSRC**, Funding for workshop “Recent trends in p-adic cohomology” (Imperial College Platform Grant), £10,000.

2014 **EPSRC**, Doctoral Prize Fellowship (PI), £21,064.

Journal Articles

- B. Chiarellotto and C. Lazda, *Around ℓ-independence*, to appear in Compos. Math.
- C. Lazda, *Fundamental groups and good reduction criteria for curves over positive characteristic local fields*, to appear in J. Théor. Nombres Bordeaux.
- B. Chiarellotto and C. Lazda, *Combinatorial degenerations of surfaces and Calabi–Yau threefolds*, Algebra & Number Theory, (2016) **10** (10):2235–2266.
- C. Lazda, *Incarnations of Berthelot's conjecture*, J. Number Theory (2016) **166**:137–157.
- C. Lazda, *Relative fundamental groups and rational points*, Rend. Sem. Mat. Univ. Padova (2015) **134**:1–45.
- C. Lazda, *Rigid rational homotopy types*, Proc. London Math. Soc. (2014) **109** (2):523–551.

Monographs

- C. Lazda and A. Pál, *Rigid cohomology over Laurent series fields*, Springer (2016), vol. 21 of 'Algebra and Applications', pp x+267.

Preprints

- B. Chiarellotto, C. Lazda and C. Liedtke, *A Néron–Ogg–Shafarevich criterion for K3 Surfaces*.
  `http://arxiv.org/abs/1701.02945` (51 pages)
- C. Lazda and A. Pál, *A homotopy exact sequence for overconvergent isocrystals*.
  `http://arxiv.org/abs/1704.07574` (31 pages)
- C. Lazda and A. Pál, *Cycle classes in overconvergent rigid cohomology and a semistable Lefshetz $(1,1)$ theorem*.
  `http://arxiv.org/abs/1701.05017` (19 pages)

Activities Organised

Oct 2017 **Workshop: p-adic cohomology and arithmetic applications**, *Banff International Research Station*, Canada.
Joint with A. Pál, K. Kedlaya and T. Abe.

Feb 2017 **Workshop: Interactions between Arithmetic and Homotopy Theory**, *Imperial College London*, UK.
Joint with A. Pál, and T. Schlank.

Spring 2016 **Study group: Moduli of p-divisible groups**, *Università Degli Studi di Padova*, Italy.
Joint with B. Chiarellotto and M. Longo.

Mar 2015 **Workshop: Recent trends in p-adic cohomology**, *Imperial College London*, UK.
Joint with A. Pál.

Conference Talks

Apr 2018 **Arithmetic and Geometry**, *Technische Universität München*, Germany.

Mar 2017 **p-adic Analytic Geometry and Differential Equations**, *CIRM*, France.
Title: *A semistable Lefschetz $(1,1)$ theorem in equicharacteristic.*

Sep 2015 **Interactions between Arithmetic and Homotopy Theory**, *Imperial College London*, UK.
Title: *Rational homotopy types and mixedness.*

Jul 2015 **p-adic Manifolds and Applications**, *Universität Wuppertal*, Germany.
Title: *p-adic cohomology: classical and over Laurent series fields.*

Jun 2015 **Function Fields, Zeta Functions and Drinfel'd Modular Forms**, *Imperial College London*, UK.
Title: *Rigid cohomology over Laurent series fields.*

Jun 2013 **TCC Graduate Event Day in Number Theory**, *University of Bristol*, UK.
Title: *Rigid rational homotopy types.*

Invited Seminars

Nov 2017 **Vrije Universiteit Amsterdam**, *Intercity Number Theory Seminar*, Netherlands.

Oct 2017 **Université Grenoble Alpes**, *Fourier Institute*, France.

Sep 2017 **Universiteit van Amsterdam**, *KdVI*, Netherlands.

June 2017 **IMJ-PRG**, *Paris Number Theory Seminar*, France.

May 2017 **Adam Mickiewicz University**, *Poznań*, Poland.

Mar 2017 **Università Degli Studi di Padova**, *Seminario Dottorato*, Italy.

Dec 2016 **IRMA, Université de Strasbourg**, France.

Nov 2016 **Université de Rennes I**, France.

Apr 2016 **Università Degli Studi di Milano**, Italy.

Jun 2015 **Università Degli Studi di Padova**, Italy.

Dec 2014 **MPIM Bonn**, Germany.

Nov 2014 **University of Cambridge**, *Number Theory Seminar*, UK.

Jul 2014 **Università Degli Studi di Padova**, Italy.

Jun 2014 **University of Oxford**, *Number Theory Seminar*, UK.

Jun 2014 **University College London**, *London Number Theory Seminar*, UK.

Research Visits

Dec 2017 **Technische Universität München**, Germany.
Host: Prof. C. Liedtke

Mar 2017 **Institut Mittag-Leffler**, Sweden.
Research Program: Algebro-Geometric and Homotopical Methods

Nov 2016 **Université de Rennes I**, France.
Host: Prof. B. Le Stum

May 2016 **Imperial College London**, UK.
Host: Dr. A. Pál

Jun 2015 **Università Degli Studi di Padova**, Italy.
Host: Prof. B. Chiarellotto

Dec 2014 **MPIM Bonn**, Germany.
Host: Dr. A. Pál

Jul 2014 **Università Degli Studi di Padova**, Italy.
Host: Prof. B. Chiarellotto

Teaching Experience

Mar – Jun 2016, 2017 **Algebraic Geometry**, *Università Degli Studi di Padova*, Italy.
Class size: 25, Level: Masters.
Introductory course in algebraic geometry given with B. Chiarellotto for masters students on the ALGANT program in Padova. Lectures and online discussion groups.

Feb 2016 **Moduli of p-divisible groups**, *Università Degli Studi di Padova*, Italy.
Class size: $\sim$20, Level: Ph.D. upwards.
Study group talks on p-divisible groups.

Jun 2015 **Fundamental groups in algebraic geometry**, *Università Degli Studi di Padova*, Italy.
Class size: 25, Level: Masters.
4 lecture mini-course on fundamental groups in algebraic geometry for masters students on the ALGANT program in Padova.

Oct – Dec 2014 **The Weil conjectures and Betti numbers of moduli spaces**, *London School of Geometry and Number Theory*, UK.
Class size: 15, Level: 1st year Ph.D.
10 lecture course on the Weil conjectures and Monsky–Washnitzer cohomology for first year Ph.D. students in London.

Oct – Dec 2013 **Tutor in Foundations of Analysis**, *Imperial College London*, UK.
Class size: 10, Level: 1st year undergraduate.
Tutorials for first year undergraduates involving going through course material and problem sheets in small groups of students, as well as marking course homework.

Oct 2011 – Dec 2013 **Graduate Teaching Assistant**, *Imperial College London*, UK.
Class size: $\sim$50, Level: 1st – 3rd year undergraduate.
Courses: Foundations of Analysis, Real Analysis, Complex Analysis, Algebra I & II, Linear Algebra.
Going through course material and problem sheets one on one with students.

Oct 2010 – Oct 2015 **London Number Theory Seminar**, *Imperial College, University College, King's College London*, UK.
Class size: $\sim$20, Level: Ph.D. upwards.
Regular talks given as part of study groups for number theorists in London on a wide range of research level topics.

Service

Refereeing.
Algebra & Number Theory, Commentarii Mathematici Helvetici, Documenta Mathematica, International Mathematics Research Notices, Journal of Number Theory, Revista Matemática Complutense, Transactions of the American Mathematical Society.

Reviewing.
MathSciNet.

Languages

English Native
French Basic *IB Standard Level*
Italian Basic *CEFR Level B1*

Computer skills

Linux, Windows, Mac OS, Python, C, Mathematica, LaTeX.

References

Available on request.