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Address Department of Mathematics and Statistics  
University of Reading  
Whiteknights  
PO Box 220  
Reading RG6 6AX  
UK

Email racheldominicanewton@gmail.com

Website <https://racheldominica.wordpress.com/>

Nationality British

### Research interests

I am particularly interested in local-global principles in arithmetic geometry, and when and why such principles fail. I use algebraic techniques such as class field theory and Galois cohomology to answer questions about rational points on varieties. I like to collaborate with analytic number theorists and algebraic geometers, as well as other algebraic number theorists, to tackle arithmetic problems using a wide variety of tools.

### Employment

2016 – Lecturer in Pure Mathematics at the University of Reading.

2014 – 2015 EPDI fellow at Max Planck Institute for Mathematics (MPIM) Bonn, and Institut des Hautes Études Scientifiques (IHÉS).

2012 – 2014 Postdoc at Universiteit Leiden and postdoctoral fellow at MPIM Bonn.

### Education

2008 – 2012 PhD in Number Theory at the University of Cambridge. Supervisor: Tim Dokchitser.

2007 – 2008 MAST (Part III of the Cambridge Mathematical Tripos). Result: Distinction.

2004 – 2007 BSc in Mathematics at the University of Warwick. Result: First Class Hons. (99.9%).

### Publications and preprints

- (11) *A bound on the primes of bad reduction for CM curves of genus 3*, with Pınar Kılıçer, Kristin Lauter, Elisa Lorenzo García, Ekin Ozman and Marco Streng. Submitted. (15 pages). <https://arxiv.org/abs/1609.05826>
- (10) *The Hasse norm principle for abelian extensions*, with C. Frei and D. Loughran. Submitted. (38 pages) <http://arxiv.org/abs/1508.02518>
- (9) *Orbifold autoequivalent exceptional unimodular singularities*, with A. Ros Camacho. <http://arxiv.org/abs/1607.07081>
- (8) *Shadow lines in the arithmetic of elliptic curves*, with J. Balakrishnan, M. Çiperiani, J. Lang and B. Mirza. WIN 3, Directions in Number Theory, AWM Series 3, Springer, to appear. (16 pages.)
- (7) *Strangely dual orbifold equivalence I*, with A. Ros Camacho, including an appendix by A. Ros Camacho and F. Zerbini. Journal of Singularities **14** (2016) (23 pages.)
- (6) *The proportion of failures of the Hasse norm principle*, with T.D. Browning. Matematika, **62**, Issue 02, (2016), pp. 337–347.

- (5) *Transcendental Brauer groups of products of CM elliptic curves.* J. London Math. Soc., 2015; doi: 10.1112/jlms/jdv058 (21 pages.)
- (4) *Bad reduction of genus 3 curves with complex multiplication,* with I. Bouw, J. Cooley, K. Lauter, E. Lorenzo García, M. Manes and E. Ozman. Women in Numbers Europe, Research Directions in Number Theory, AWM Series, Volume 2 (2015), Springer.
- (3) *Realising the cup product of local Tate duality.* J. Théor. Nombres Bordeaux, **27**, No. 1 (2015), pp. 219 –244.
- (2) *Computing the Cassels-Tate pairing on the 3-Selmer group of an elliptic curve,* with T.A. Fisher. Int. J. Number Theory, **10**, No. 7, (2014), pp. 1881 – 1907.
- (1) *Explicit local reciprocity for tame extensions.* Math. Proc. Camb. Philos. Soc. **152**, Issue 03, (2012), pp. 425 – 454.

### In preparation

- (1) *Transcendental Brauer groups in a family of non-diagonal quartic surfaces.*
- (2) *The Hasse norm principle for  $D_4$ ,  $A_4$ ,  $S_4$ ,  $A_5$  and  $S_5$  extensions.*
- (3) *Open questions on Prym varieties,* with T. Özlüm Çelik, Y. Elias, B. Gunes, E. Ozman, R. Pries and L. Thomas

### Invited conference talks

- 2017 Diophantine Problems (DIOP), University of Manchester
- 2017 Explicit Methods for Elliptic Curves and Modular Forms, Boğaziçi University, Istanbul
- 2017 Higher obstructions to rational points, Emory University, Atlanta
- 2017 British Mathematical Colloquium 2017, Durham University
- 2015 Modular Forms and Curves of Low Genus: Computational Aspects, ICERM
- 2015 Rational points / Pontos Rationais, IMPA
- 2014 Women in Numbers 3, BIRS, Banff
- 2012 British Mathematical Colloquium, University of Kent
- 2012 Trinity Mathematical Society Symposium, University of Cambridge

### Selected invited seminar talks

- 2017 Heilbronn Seminar, University of Bristol
- 2017 London Number Theory Seminar, UCL
- 2017 Pure Mathematics Day, University of Reading
- 2016 Séminaire d'Arithmétique à Lyon, École Normale Supérieure de Lyon
- 2016 Number Theory Seminar, University of Nottingham
- 2016 Number Theory Seminar, University of Manchester
- 2016 Number Theory Seminar, University of Oxford
- 2016 Number Theory Seminar, University of Copenhagen
- 2016 Séminaire d'Algèbre et de Théorie des Nombres, EPFL Lausanne
- 2016 Arithmetic Study Group, University of Durham
- 2016 Pure Mathematics Colloquium, University of Durham
- 2016 Pure Mathematics Seminar, University of Exeter
- 2016 Number Theory Seminar, University of Warwick

- 2015 Number Theory Lunch Seminar, Max Planck Institute for Mathematics, Bonn
- 2015 Geometry and Algebra Seminar, Universiteit Utrecht
- 2015 Oberseminar Zahlentheorie und Arithmetische Geometrie, Leibniz Universität Hannover
- 2015 Oberseminar, Carl von Ossietzky Universität Oldenburg
- 2015 Number Theory Seminar, University of Cambridge
- 2015 Lectures on Abelian Varieties with Complex Multiplication, Istanbul Center for Mathematical Sciences
- 2014 Séminaire de théorie des nombres de l'IMJ-PRG, Paris
- 2014 Oberseminar, Universität Ulm
- 2014 Séminaire “Variétés Rationelles”, Institut Henri Poincaré, Paris
- 2014 Linfoot Seminar, University of Bristol
- 2014 Number Theory Seminar, University of Warwick
- 2014 Oberseminar Zahlentheorie, Ludwig-Maximilians-Universität München
- 2013 Algebra & Number Theory Seminar, University of York
- 2013 Algebra, Geometry & Number Theory Seminar, Universiteit Leiden
- 2013 Number Theory Lunch Seminar, Max Planck Institute for Mathematics, Bonn
- 2013 Number Theory Seminar, University of Oxford

### Grants, awards and honours

- 2016 Total of \$47000 in grant money raised for the Women in Numbers Europe 2 workshop, from American Women in Mathematics, Clay Mathematics Institute, Foundation Compositio, Heilbronn Institute, Microsoft Research and the Number Theory Foundation.
- 2016 *London Mathematical Society Research in Pairs* grant for the visit of Giancarlo Lucchini Arteché
- 2014 – 2016 *European Post-Doctoral Institute (EPDI) laureate.*
- 2012 *Cambridge Philosophical Society Research Studentship Grant* for the conclusion of an exceptionally promising piece of research.
- 2008 – 2012 *EPSRC scholarship*: full funding for the PhD programme, awarded by the Department of Pure Mathematics and Mathematical Statistics, University of Cambridge.
- 2010 *London Mathematical Society Travel Grant for 2010 International Congress of Mathematicians*
- 2010 *London Mathematical Society prize*: for one of the two best talks at the Graduate Student Meeting.
- 2010 *Smith-Knight & Rayleigh-Knight essay competition 2nd prize*: awarded by the University of Cambridge for an essay on an original mathematical topic by a 2nd year PhD student.
- 2009 – 2010 Total of £17676 in grant money raised for the Young Researchers in Mathematics 2010 conference, from Winton Capital Management, London Mathematical Society, Roberts fund, EPSRC, Cambridge Philosophical Society, Institute of Mathematics and its Applications, and Cambridge University Press.
- 2008 *Gonville and Caius College Honorary Senior Scholarship*: for outstanding performance in the Part III examinations.
- 2007 *The University of Warwick Third Year Mathematics Prize.*

- 2007 *IBM Student Recognition Award*: for exceptional students in science and technology.
- 2006 *The University of Warwick Second Year Mathematics Prize*.

### Masters theses supervised

- 2013 Erik Visse, *Local computations on the Cassels-Tate pairing on an elliptic curve*, (assisted by David Holmes), Universiteit Leiden. Grade: 8.5/10.

### Courses taught

- 2017 *Foundations of Mathematics*, first year undergraduate course (with Michael Levitin), University of Reading.
- 2016 *Topology and Linear Analysis*, third year undergraduate course (with Tobias Kuna), University of Reading.
- 2014 *Local fields*, graduate course, Undergraduate and Graduate Mathematics Summer School, Nesin Mathematics Village, Turkey.
- 2013 *Class field theory*, graduate course, (with Hendrik Lenstra), University of Leiden.
- 2013 *Further topics in elliptic curves*, graduate reading course, (with David Holmes), University of Leiden.
- 2012 *Elliptic curves*, graduate course, (with David Holmes), University of Leiden.
- 2011 *Background in Galois theory*, one-day graduate course, (with Jack Lamplugh), University of Cambridge.
- 2011 *Introduction to group theory*, first year undergraduate short course, University of Cambridge.
- 2010 *Background in Galois theory*, one-day graduate course, University of Cambridge.

### Conference and seminar organisation

- Co-organiser of *LMS Prospects in Mathematics Meeting* (Reading, Sept 2017.)
- Co-organiser of *Women in Numbers Europe 2* (Lorentz Center, Leiden, Sept 2016.)
- Co-organiser of the *Number Theory Lunch Seminar* (MPIM Bonn, Oct 2014 - Aug 2015.)
- Co-organiser of the *Iwasawa Theory Study Group* (Cambridge, Oct 2010 - Dec 2011).
- Co-organiser of the *Young Researchers in Mathematics* conference (Cambridge, March 2010).
- Number Theory group leader at the *Part III Seminar Series* (Cambridge, 2009).

### Academic service

- Referee for *Forum of Mathematics, Sigma*.
- Referee for *Proceedings of the American Mathematical Society*.
- Reviewer for *Mathematical Reviews*.
- Editor of *Women in Numbers Europe 2*, Research Directions in Number Theory, AWM Series, Springer
- London Mathematical Society Representative for University of Reading 2016 - present.

### Outreach and volunteer work

- Supervisor for the Sutton Trust Summer School in Mathematics (Cambridge, 2011 and 2012). These summer schools were for academically able Year 12 students thinking of applying to Cambridge. The students were from backgrounds that have not traditionally applied to Cambridge.
- Part III Cafe volunteer (Cambridge, Oct 2008 - Jun 2009). My responsibilities included talking to students about their work and other concerns such as PhD applications.