

Alexander Betts

Full name Luke Alexander Betts
Address Max Planck Institut für Mathematik
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Academic positions held

2018–2020 Postdoctoral Fellow at Max Planck Institut für Mathematik
2017–2018 Postdoctoral Research Assistant at King’s College London

Education

2014–2018 Doctor of Philosophy (DPhil) at Merton College, Oxford
Heights via anabelian geometry and local Bloch–Kato Selmer sets
Supervised by Minhyong Kim
Funded by the Wang Scholarship
2013–2014 Certificate of Advanced Study in Mathematics (Part III)
at Trinity College, Cambridge
Distinction (second in year)
2010–2013 BA in Mathematics at Trinity College, Cambridge
First class in all three years
Appointed Junior Scholar in 2011, Senior Scholar in 2012

Publications and preprints

2019 *The local theory of unipotent Kummer maps and refined Selmer schemes.* With N. Dogra. arXiv:1909.05734, 119 pages
2019 *Semisimplicity and weight–monodromy for fundamental groups.* With D. Litt. Submitted to the Proceedings of the Simons Symposium on p -adic Hodge Theory. arXiv:1912.02167, 28 pages
2019 *Variation of Tamagawa numbers of semistable abelian varieties in field extensions.* With V. Dokchitser. Math. Proc. Cam. Phil. Soc., **116**, pages 487–521 (doi:10.1017/S0305004118000075)
2018 *On the computation of Tamagawa numbers and Néron component groups of semistable hyperelliptic curves.* Submitted to Journal of Number Theory. arXiv:1808.05479, 48 pages
2017 *The motivic anabelian geometry of local heights on abelian varieties.* To be submitted to Memoirs of the AMS. arXiv:1706.04850, 98 pages
2011 Supplied the proof of proposition 6.4. in *On sets defining few ordinary lines.* B. Green and T. Tao, Discrete and Computational Geometry, **50**(2), pages 409–468, 2013

Academic talks and courses

- 2020 *Weight–monodromy and canonical paths on varieties*, Paris 6 & 7 Number Theory Seminar
- 2019 *Non-abelian Kummer maps for curves*, Max-Planck Institute Number Theory Seminar
- 2019 *Non-abelian Kummer maps for curves*, Frankfurt Number Theory Seminar
- 2019 *Local non-abelian Kummer maps for curves*, Cambridge Number Theory Seminar
- 2018 *The Chabauty–Kim method*, three-lecture mini-course at Paris 6
- 2017 *Iterated integrals, Green’s functions and fundamental groups*, Bristol Linfoot Number Theory Seminar
- 2017 *Heights and anabelian geometry*, Oxford Number Theory Seminar
- 2017 *Computing Tamagawa numbers of hyperelliptic curves*, ICTP Summer School on hyperelliptic curves
- 2017 *Local heights on abelian varieties via non-abelian Bloch–Kato Selmer sets*, BIRS Workshop on Nilpotent Fundamental Groups
- 2017 *Non-abelian Bloch–Kato Selmer sets and heights on abelian varieties*, Warwick Number Theory Seminar
- 2017 *Non-abelian Bloch–Kato Selmer sets and an application to heights on abelian varieties*, 3rd Workshop on Interactions between Arithmetic and Homotopy, Imperial College London

Other academic experience

- 2014 Master’s essay *Derived categories and Grothendieck duality*, under M. Gross
- 2013 Research project *Explicit reduction modulo p of certain 2-dimensional crystalline Galois representations*, under K. Buzzard

Contributions to academic activities

- 2020 Project group leader for Arizona Winter School
- 2019 Organised Kleine Arbeitsgruppe *Siegel’s Theorem, after Lawrence–Venkatesh*
- 2018 Co-organised research workshop *Arithmetic of Curves*, Baskerville Hall
- 2014–2018 Organised study groups on étale cohomology (2014), on anabelian geometry (2016), and on motives (2018)
- 2015–2016 Organised the Oxford Junior Number Theory Seminar
- 2015–2016 Set up and organised the Oxford Mathematical Institute Happy Hour, providing an informal environment to facilitate the formation of interdisciplinary connections

Teaching experience

2017–2018	Supervisor in King’s College London for BSc & MSc project <i>Counterexamples to the Hasse principle</i>
2011–	Tutor at UKMT (UK Mathematics Trust) training camps (Cambridge camp 2011–2015 & 2017–, and Oxford camp 2015–2017)
2015–2016 & 2018	Tutor in Oxford (Geometry, Number Theory, and Rings and Modules)
2014–2015	Teaching Assistant in Oxford (Elliptic Curves and Lie Algebras)
2014	Supervisor in Cambridge (Galois Theory)
2010–2012	Mentor for the UKMT Senior Mentoring Scheme
2009–2010	Private tutor for A-level Mathematics

Involvement with mathematics enrichment

2012–	British Mathematical Olympiad Problem Selection Committee
2011–	Marker for rounds 1 & 2 of the British Mathematical Olympiad (BMO1 Problem Captain from 2012)
2019	Member of International Mathematical Olympiad Problem Selection Committee
2011–2016	Chair of the UKMT International Problem Selection Committee
2011, 2013 & 2015	Composed problems for Romanian Master of Mathematics competition (2011 problem 5, 2013 problem 2, 2015 problem 3)
2012–2013	UKMT Advanced Mentoring Scheme Coordinator
2012	Marking Coordinator for the European Girls’ Mathematical Olympiad