Steven Charlton

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Work and experience

Since Apr 2023	Postdoctoral researcher, at the Max Planck Institute for Mathematics, Bonn
Apr 2020 – Mar 2023	Postdoctoral researcher, at Universität Hamburg (Apr 2021 - Mar 2023 via *DFG Eigene Stelle research grant*)
Jan 2018–Dec 2019	Postdoctoral researcher, at the Max Planck Institute for Mathematics, Bonn
Oct 2016–Sep 2017	Postdoctoral researcher, at Universität Tübingen, via the *Teach@Tübingen scholarship program*

Guest/visiting positions

Jul 2023	*Invited researcher, Brin Mathematics Resarch Center, University of Maryland*
Jul 2022	Guest researcher, *Programme: K-theory, algebraic cycles and motivic homotopy theory*, Isaac Newton Institute, Cambridge
Mar 2020	Visitor, at the Max Planck Institute for Mathematics, Bonn
Jan, Feb 2020	Guest researcher, *Programme: K-theory, algebraic cycles and motivic homotopy theory*, Isaac Newton Institute, Cambridge
Jan–Apr 2018	Invited participant, *Trimester Program: Periods in Number Theory, Algebraic Geometry and Physics*, Hausdorff Research Institute for Mathematics, Bonn
Oct–Dec 2017	Guest researcher, at the MZV Research Center, Kyushu University

Education and qualifications

2012–2016	PhD in Mathematics – Durham University, supervised by Herbert Gangl "Identities arising from coproducts on multiple zeta values and multiple polylogarithms".
2008–2012	MMath in Mathematics, First Class Honours – Durham University
2014	Durham University Learning and Teaching Award – Durham University, *Higher Education Academy accredited qualification in tertiary teaching*

Grants, awards and scholarships

2021–23	DFG Eigene Stelle research grant CH 2561/1-1, for Projektnummer 442093436, "*Cluster polylogarithms, Grassmannian polylogarithms and Zagier's conjecture on $\zeta_F(n), n \geq 5$*".
2014/15	Willmore Pure Postgraduate Award – *Department of Maths, Durham University*
2012–16	Durham Doctoral Scholarship (Faculty of Sciences) – *Durham University*

Conferences and workshop talks

11–15 Sep 2023	*Polylogarithms, Cluster Algebras, and Scattering Amplitudes, Brin MRC, Maryland* Talk: *TBA*
20–24 Mar 2023	Geometries and Special Functions for Physics and Mathematics, Bethe Centre, Bonn Talk: *The usefulness of two-one formulas (contribution to 'My Favourite Problem' session)*
27 Jun–1 Jul 2022	Point configurations: Deformations and Rigidity (Summer School) – UCL Teaching assistant: *Modular forms, universal optimality and Fourier interpolation* Talk: *Multiple zeta values and modular forms*
20–24 Jun 2022	Arithmetic geometry, cycles, Hodge theory, regulators, periods & heights – INI, Cambridge Talk: *Zagier's polylogarithm conjecture and an explicit 4-ratio*
13–17 Jun 2022	Motives and Arithmetic Groups (Summer School) – IRMA Strasbourg Talk: *Functional equations for Nielsen polylogarithms*
2–6 Mar 2020	Cluster Algebras and the Geometry of Scattering Amplitudes – Higgs Centre, Edinburgh Talk: *Cluster polylogarithms and identities*
1–12 April 2019	Workshop on Modular forms, periods, and scattering amplitudes – ETH Zürich Talk: *Clean multiple polylogarithms*

30 Jan 2018	MZV Days – Periods Trimester, HIM Bonn Talk: *Bowman-Bradley type identities for symmetrised MZV's.*
15–19 Jan 2018	Periods and Regulators Workshop – Periods Trimester, HIM Bonn Talk: *Motivic MZV's and the cyclic insertion conjecture*
11–12 Nov 2017	Polylogs, Multiple Zetas, and Related Topics – Tohoku University, Sendai Talk: *Relating multiple polylogarithms in weight ≥ 5*
3–6 April 2017	British Mathematical Colloquium 2017 – Durham University Talk (number theory track): *Motives and multiple zeta values*

Publications

- (with H. Gangl, L. Lai, C. Xu, and J. Zhao) *On two conjectures of Sun concerning Apéry-like series.* Forum Mathematicum (2023), online first, 15 pages. arXiv:2210.14704
- (with H. Gangl, and D. Radchenko.) *Functional equations of polygonal type for multiple polylogarithms in weights 5, 6 and 7.* Pure and Applied Mathematics Quarterly. 6 pages. To appear. arXiv:2012.09840.
- (with C. Duhr, and H. Gangl) *Clean single valued polylogarithms.* Symmetry, Integrability and Geometry: Methods and Applications 17 (2021), #107, 34 pages. (Special issue for Dirk Kreimer's 60th birthay.)
- (with H. Gangl, and D. Radchenko.) *On functional equations for Nielsen polylogarithms.* Communications in Number Theory and Physics 15.2 (2021), pp. 363-454
- *Alternating block decomposition of iterated integrals, and cyclic insertion on multiple zeta values.* Quarterly Journal of Mathematics 72.3 (2021), pp. 975–1028
- *An analogue of cyclic insertion type identities for multiple zeta star values.* Kyushu Journal of Mathematics 74 (2020), pp. 337–352.
- (with H. Bachmann.) *Generalized Jacobi-Trudi determinants and evaluations of Schur multiple zeta values.* European Journal of Combinatorics 87 (2020), pp. 103–133.
- $\zeta(\{\{2\}^m, 1, \{2\}^m, 3\}^n, \{2\}^m)/\pi^{4n+2m(2n+1)}$ *is rational.* Journal of Number Theory 148 (2015), pp. 463–477.

Preprints

- (with H. Gangl, D. Radchenko, and D. Rudenko) *On the Goncharov Depth Conjecture and polylogarithms of depth two.* 2022, 4 pages. arXiv:2210.11938
- (with A. Keilthy) *Evaluation of the multiple zeta values $\zeta(2, \ldots, 2, 4, 2, \ldots, 2)$ via double zeta values, with applications to period polynomial relations and to multiple t values.* 2022, 47 pages. Submitted. arXiv:2210.03616
- (with M. E. Hoffman) *Symmetry results for multiple t values.* 2021, 36 pages. Submitted. arXiv:2204.14183
- *On the evaluation of the alternating multiple t value $t(\{\bar{1}\}^a, 1, \{\bar{1}\}^b)$.* 2021, 10 pages. Submitted. arXiv:2112.15349
- *On motivic multiple t values, Saha's basis conjecture and generators of alternating MZV's.* 2021, 53 pages. Submitted. arXiv:2112.14613
- *Third order coefficient of the area expansion via $\zeta(3)$.* Appendix A to L. Heller, S. Heller, and M. Traizet, "Complete families of embedded high genus CMC surfaces in the 3-sphere". 2021, 55 pages (appendix pp. 41–53). arXiv:2108.10214.
- (with H. Gangl, and D. Radchenko.) *Explicit formulas for Grassmannian polylogarithms.* 2019, 28 pages. Submitted. arXiv:1909.13869.
- *A review of Dan's reduction method for multiple polylogarithms.* 2017, 41 pages. arXiv:1703.03961.

Teaching experience

2011–2016	Grading: Algebra II; Number Theory III/IV; Analysis I; Elliptic Functions & Modular Forms III/IV Tutorials/computer classes: Analysis I; Algebra II; Numerical Analysis II *Durham University*
Winter 2016/17	Lecture course: Numbers!, *Universität Tübingen*
Summer 2017	Lecture course: Primes of the form $x^2 + ny^2$, *Universität Tübingen*
2020–2021	Grading: Advanced algebra Exercises classes: Multiple zeta values; Mathematik III für Studierende der Physik *Universität Hamburg*

Selected Seminar talks

31 May 2023	*Multiple zeta values in (differential) geometry and number theory*, Differential geometry seminar (online), BIMSA, Beijing
3 May 2023 &	*Generators of multiple t values and alternating multiple zeta values.* Number Theory Seminar, MPIM Bonn)

5 Jun 2023	Oberseminar Zahlentheorie, Universität zu Köln
	Multiple zeta values in block degree 2, and the period polynomial relations.
5 Dec 2022 & 20 Dec 2022	Sèminaire de thèorie des nombres de l'IMJ-PRG, Paris Algebra Seminar, Groningen
12 May 2022	*Computing $\zeta(n_1, \ldots, n_r)$ numerically: explanation of Zagier's approach and some extensions.* Computing multiple zeta seminar (online)
13, 20 Apr 2022	*Symmetries of multiple t values.* Arithmetische Geometrie und Zahlentheorie seminar, Universität Hamburg
17 Dec 2021	*Generators of multiple t values.* Number Theory seminar, ETH Zürich
6 Jul 2021	*Functional equations for Nielsen polylogarithms.* Japan-Europe Number Theory Exchange seminar (online)
	Zagier's polylogarithm conjecture and an explicit 4-ratio.
15 Jul 2020 & 22 Jun 2020	Number Theory Seminar (online), MPIM Bonn Multiple Zeta Value Seminar (online), Kyushu
5 Feb 2020	Heilbronn Number Theory Seminar, Bristol University
4 Feb 2020	Arithemtic Study Group, Durham University
29 Jan 2020	Arithmetische Geometrie und Zahlentheorie Seminar, Universität Hamburg
24 Apr 2018	*Cyclic insertion on MZV's and the alternating block decomposition.* Oberseminar Zahlentheorie, Universität zu Köln
15 Mar 2018	*Various aspects of (multiple) polylogs.* Oberseminar, MPIM Bonn
17 Oct 2017	*The block decomposition of iterated integrals, and cyclic insertion on MZV's.* Multiple Zeta Value seminar, Kyushu University
18, 25 Oct 2016	*Motivic multiple zeta values, cyclic insertion and the block decomposition.* Oberseminar Analysis und Zahlentheorie, Universität Tübingen
7 Nov 2014	*The coproduct on multiple zeta values, and 'almost' identities.* Algebra & Combinatorics seminar, ICMAT, Madrid

Outreach

Oct 2015	The cool shapes of viruses, *Maths department's exhibition at the Celebrate Science Festival, Durham University*
Sep 2018	Maths of the Rubik's cube, *Tag der offenen Tür/Max-Planck-Tag, MPIM Bonn*

Services and organisational responsibilities

Since Apr 2022	Co-organiser of the (online) "Computing multiple zeta seminar", with H. Bachmann, M. Hirose, N. Sato, K. Tasaka.
Since Mar 2019	Referee for various journals, including *Journal of Number Theory, Research in the Mathematical Sciences, The Ramanujan Journal, Mathematische Annalen.*
Since Jul 2017	Reviewer for `MathSciNet`.
Jan 2021	Compiled the "Periods, polylogarithms, zeta and L-functions, special values" section for the overall MPIM report (2018–2020), summarising the final reports of guests working in these areas during that period.
2014/15	Organiser of the "Geometry and Algebra Forum" (Durham University, pure maths postgraduate student seminar).