David Kurniadi Angdinata

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Please refer to my `website` for a full list of `projects`, `talks`, `conferences`, `teaching`, and `notes`.

Research interests

I am broadly interested in the computational aspects of abelian varieties over global fields in the context of the Birch and Swinnerton-Dyer conjecture, as well as in local-global obstructions to rational points on varieties via cohomological gadgets such as the Brauer group. My PhD thesis will be on some explicit aspects of special values of L-functions of elliptic curves twisted by Dirichlet characters. Recently, I have been thinking of constructing databases of motives over global function fields, analogous to the LMFDB.

I am also interested in the formalisation of arithmetic geometry in interactive theorem provers, being a pioneer in the development of the theory of elliptic curves in Lean. Over the next few years, I will be formalising the proofs of fundamental arithmetic results, such as the Hasse–Weil bound and the Mordell–Weil theorem, culminating in the statements of major theorems and open conjectures.

Finally, I am passionate in pedagogical aspects of undergraduate mathematics education.

Academic record

10/25 – 8/27	Senior Research Associate	*University of East Anglia*
	Grant: Scalable theorem proving via mathematical databases	
9/21 – 9/25	PhD Mathematics	*London School of Geometry and Number Theory*
	Thesis: L-functions of Dirichlet twists of elliptic curves: computations and congruences	
10/20 – 6/21	MASt Pure Mathematics	*University of Cambridge*
10/16 – 6/20	MEng Pure Mathematics and Computational Logic	*Imperial College London*
1/14 – 12/15	Singapore-Cambridge GCE A-level	*Temasek Junior College*
1/12 – 12/13	Singapore-Cambridge GCE O-level	*Anderson Secondary School*

Employment record

4/25 – 6/25	Part-time Lean expert at Harmonic
7/22 – 9/22	Research assistant at Huawei Technologies R&D UK Ltd
6/19 – 9/19	Cryptography engineer at Adjoint UK Ltd
	Developed and published the Haskell libraries `galois-field`, `elliptic-curve`, and `pairing`

Published papers

5/25	On L-values of elliptic curves twisted by cubic Dirichlet characters
	In *Canadian Journal of Mathematics*.
7/23	An elementary formal proof of the group law on Weierstrass elliptic curves in any characteristic (with Junyan Xu)
	In *14th International Conference on Interactive Theorem Proving (ITP 2023)*, volume 268 of *Leibniz International Proceedings in Informatics*, pages 6:1–6:19. Schloss Dagstuhl – Leibniz-Zentrum für Informatik, Dagstuhl Publishing, Wadern, Germany, 2023.

Mathlib contributions

Elliptic curves	The `discriminant` of a cubic equation, `Weierstrass` equations and their changes of variables, the group law in `affine` coordinates, the group law in `Jacobian` coordinates, the group law in `projective` coordinates, `division polynomials` and their degrees, the theory of `elliptic divisibility sequences`
Ring theory	`maximal ideals` and `maximal spectra`, the ring of `S-integers` of a Dedekind domain, the `Selmer group` of a Dedekind domain

Research projects

?/25	**Computing motivic L-functions over global function fields** Preprint in preparation
?/25	**Formalising division polynomials, elliptic divisibility sequences, the torsion subgroup, and the Tate module of Weierstrass elliptic curves** (joint with Peiran Wu and Junyan Xu) Preprint in preparation
10/24	**Algebraicity of Artin–Hasse–Weil L-series over global function fields** Submitted to the *Bulletin of the London Mathematical Society*

Selected talks

4/9/25	**Computing Dirichlet L-functions over global function fields** Contributed talk for *Young Researchers in Algebraic Number Theory* in Nottingham
31/7/25	**Rational points on elliptic curves in Lean** Contributed talk for *Rational Points 2025* in Schney
25/6/25	**Elliptic divisibility sequences in Lean** Contributed talk for *British Mathematical Colloquium* in Exeter
25/3/25	**Teaching a computer algebraic number theory** Seminar talk for *Algebra, Number Theory, Logic and Representation Theory Seminar* in Norwich
3/3/25	**Computing L-functions over global function fields** Workshop talk for *Elliptic Curves in the Cotswolds* in Stonehouse
13/2/25	**Algebraising foundations of elliptic curves** Seminar talk for *Formalisation of Mathematics with Interactive Theorem Provers* in Cambridge
17/1/25	**Division polynomials of elliptic curves** Contributed talk for *Lean Together 2025* in Zoom (Online)
5/9/24	**Twisted elliptic L-values over global fields** Contributed talk for *Algebraic Number Theory* in Munich
31/7/24	**Denominators of BSD quotients** Contributed talk for *Young Researchers in Algebraic Number Theory* in Oxford
26/6/24	**Elliptic curves in mathlib** Workshop talk for *Formalising Algebraic Geometry* in Pasadena (Online)
19/6/24	**Twisted L-values of elliptic curves** Contributed talk for *75th British Mathematical Colloquium* in Manchester
24/4/24	**L-values of elliptic curves twisted by cubic characters** Seminar talk for *Linfoot Number Theory Seminars* in Bristol
25/8/23	**Twisted elliptic L-values** Contributed talk for *Early Number Theory Researchers Workshop 2023* in Bielefeld
2/8/23	**An elementary formal proof of the group law on Weierstrass elliptic curves in any characteristic** Conference talk for *14th International Conference on Interactive Theorem Proving* in Białystok
25/4/22	**Elliptic curves in Lean** Workshop talk for *Huawei Technologies R&D UK Ltd* in Cambridge

Selected conferences

3–5/9/25	Young Researchers in Algebraic Number Theory	*Nottingham*
27/7–2/8/25	Rational Points 2025	*Schney*
25–26/7/25	Magma Meeting: Rational Points 2025	*Würzburg*
21–25/7/25	Formalizing Class Field Theory	*Oxford*
14–18/7/25	LMFDB Workshop	*Cambridge, MA (Online)*
2–6/9/24	Algebraic Number Theory	*Munich*
22–25/7/24	International Congress on Mathematical Software (co-organiser)	*Durham*
24–28/6/24	Formalising Algebraic Geometry	*Pasadena (Online)*
31/7–4/8/23	14th International Conference on Interactive Theorem Proving	*Białystok*

Selected teaching

5/25 – 6/25	Supervisions for *Year 1 Term 3 research projects* Projects on Mordell's equation and Lean	*UCL*
1/25 – 3/25	Laboratory for *MATH60040 Formalising Mathematics*	*ICL*
5/24 – 6/24	Supervisions for *Year 1 Term 3 research projects* Projects on how to tell if a number is prime and group theory and Rubik's cube	*UCL*
1/24 – 3/24	Problem classes and marking for *MATH0034 Number Theory*	*UCL*
1/24 – 3/24	Tutorials for *6CCM351A Representation Theory of Finite Groups*	*KCL*
5/23 – 6/23	Supervisions for *Year 1 Term 3 research projects* Projects on cryptography, sums of squares, and the axiom of choice	*UCL*
1/23 – 3/23	Tutorials and marking for *5CCM251A Discrete Mathematics*	*KCL*
10/22 – 12/22	Tutorials and marking for *5CCM224A Introduction to Number Theory*	*KCL*
5/22 – 6/22	Supervisions for *Year 1 Term 3 research projects* Projects on continued fractions, cryptography, and Lean	*UCL*
10/21 – 12/21	Tutorials and marking for *MATH0014 Further Linear Algebra*	*UCL*

Awards attained

2025 – 2026	LMS Early Career Fellowship (declined)	*LMS/HIMR/UKRI*
2024	MAPS Faculty Education Award 2024 for individual excellence	*UCL*
2021 – 2025	Full funding for 4-year PhD research [EP/S021590/1]	*EPSRC*
2020	Governors' MSci JMC Prize for best overall performance in final year	*ICL*
2020	Donald Davies Prize for best final year individual project	*ICL*
2018	Department of Mathematics UROP research studentship	*ICL*
2017	G Research Ltd Prize for academic excellence	*ICL*
2017 – 2020	Faculty of Engineering Dean's List (2017, 2018, 2020)	*ICL*
2012 – 2015	Full 4-year school-based scholarship	*MOE Singapore*

Outreach programmes

3/25 – 4/25	Assistant for *London Maths Outreach* Assisted in an introductory course (4 weeks) on group theory for sixth form students	*London*
1/25 – 2/25	Assistant for *London Maths Outreach* Assisted in an introductory course (4 weeks) on elliptic curves for sixth form students	*London*
7/23	Assistant for *Year 12 Maths Summer School: Logic and Proof* Assisted in an introductory course (5 days) on logic and proof for sixth form students	*London*
3/23	Teacher for *London Maths Outreach* Designed an introductory course (4 weeks) on elliptic curves for sixth form students	*London*

Language skills

Languages	English, Mandarin/Hokkien, Indonesian/Malay, Japanese
Programming	Lean, Haskell, Python/SageMath, Magma, Java, C/C++, Prolog, PHP/MySQL
Tools	LaTeX, XHTML/CSS, Git, Stack, Vim

Miscellaneous activities

2022 – 2023	Private tutor for mathematics and computer science in TutorChase and ElitePrep
2020 – 2021	Owner and moderator of the Cambridge Part III Mathematics Discord server
2018 – 2021	Live-TeXed lecture notes for geometry, algebra, and number theory available on GitHub
2019 – 2020	Problems curator for the Imperial College Mathematics Competition
2018 – 2020	Organiser for the Imperial College undergraduate mathematics colloquium
2012 – 2018	Solved 180 Project Euler problems primarily in Java and Haskell