

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

## 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 <code>galois-field</code> , <code>elliptic-curve</code> , and <code>pairing</code>

## Published papers

5/25	On L-values of elliptic curves twisted by cubic Dirichlet characters In <i>Canadian Journal of Mathematics</i> .
7/23	An elementary formal proof of the group law on Weierstrass elliptic curves in any characteristic (with Junyan Xu) In <i>14th International Conference on Interactive Theorem Proving (ITP 2023)</i> , volume 268 of <i>Leibniz International Proceedings in Informatics</i> , 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
- ?/25 Algebraic proofs for elliptic divisibility sequences and division polynomials (joint with 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

- 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
- 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 <i>Year 1 Term 3 research projects</i> Projects on Mordell's equation and Lean	UCL
1/25 – 3/25	Laboratory for <i>MATH60040 Formalising Mathematics</i>	ICL
5/24 – 6/24	Supervisions for <i>Year 1 Term 3 research projects</i> 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 <i>MATH0034 Number Theory</i>	UCL
1/24 – 3/24	Tutorials for <i>6CCM351A Representation Theory of Finite Groups</i>	KCL
5/23 – 6/23	Supervisions for <i>Year 1 Term 3 research projects</i> Projects on cryptography, sums of squares, and the axiom of choice	UCL
1/23 – 3/23	Tutorials and marking for <i>5CCM251A Discrete Mathematics</i>	KCL
10/22 – 12/22	Tutorials and marking for <i>5CCM224A Introduction to Number Theory</i>	KCL
5/22 – 6/22	Supervisions for <i>Year 1 Term 3 research projects</i> Projects on continued fractions, cryptography, and Lean	UCL
10/21 – 12/21	Tutorials and marking for <i>MATH0014 Further Linear Algebra</i>	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 <i>London Maths Outreach</i> Assisted in an introductory course (4 weeks) on group theory for sixth form students	London
1/25 – 2/25	Assistant for <i>London Maths Outreach</i> Assisted in an introductory course (4 weeks) on elliptic curves for sixth form students	London
7/23	Assistant for <i>Year 12 Maths Summer School: Logic and Proof</i> Assisted in an introductory course (5 days) on logic and proof for sixth form students	London
3/23	Teacher for <i>London Maths Outreach</i> 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