

# 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 *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 <code>discriminant</code> of a cubic equation, <code>Weierstrass</code> equations and their changes of variables, the group law in <code>affine</code> coordinates, the group law in <code>Jacobian</code> coordinates, the group law in <code>projective</code> coordinates, <code>division polynomials</code> and their degrees, the theory of <code>elliptic divisibility sequences</code>
Ring theory	<code>maximal ideals</code> and <code>maximal spectra</code> , the ring of <code>S-integers</code> of a Dedekind domain, the <code>Selmer group</code> of a Dedekind domain

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## Research projects

- ?/26 Tamagawa numbers of elliptic curves over function fields (joint with Mentzelos Melistas)  
Preprint in preparation
- ?/26 Computing L-functions of  $\lambda$ -adic representations over global function fields  
Preprint in preparation
- ?/26 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*

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## 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 *Linfot 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

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## Selected conferences

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|-------------|--|------------------------|
| 29/6–3/7/26 | Bridging Lean and the LMFDB (co-organiser)                     | Norwich                |
| 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              |

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## Selected teaching

5/25 – 6/25	Supervisions for <i>Year 1 Term 3 research projects</i> Projects on Mordell's equation and Lean	<i>UCL</i>
1/25 – 3/25	Laboratory for <i>MATH60040 Formalising Mathematics</i>	<i>ICL</i>
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	<i>UCL</i>
1/24 – 3/24	Problem classes and marking for <i>MATH0034 Number Theory</i>	<i>UCL</i>
1/24 – 3/24	Tutorials for <i>6CCM351A Representation Theory of Finite Groups</i>	<i>KCL</i>
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	<i>UCL</i>
1/23 – 3/23	Tutorials and marking for <i>5CCM251A Discrete Mathematics</i>	<i>KCL</i>
10/22 – 12/22	Tutorials and marking for <i>5CCM224A Introduction to Number Theory</i>	<i>KCL</i>
5/22 – 6/22	Supervisions for <i>Year 1 Term 3 research projects</i> Projects on continued fractions, cryptography, and Lean	<i>UCL</i>
10/21 – 12/21	Tutorials and marking for <i>MATH0014 Further Linear Algebra</i>	<i>UCL</i>

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## Awards attained

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

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## 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	<i>London</i>
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	<i>London</i>
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	<i>London</i>
3/23	Teacher for <i>London Maths Outreach</i> Designed an introductory course (4 weeks) on elliptic curves for sixth form students	<i>London</i>

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## 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

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## 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