

David Kurniadi Angdinata

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Research interests

I currently work in the arithmetic of abelian varieties over global fields, specifically on the special values of their twisted L-functions in the context of the refined Birch and Swinnerton-Dyer conjecture. I am involved in the formalisation of arithmetic geometry in interactive theorem provers, being a pioneer in the development of the theory of elliptic curves in Lean. I am also interested in understanding local-global obstructions to rational points on varieties, via cohomological gadgets such as the Brauer group. Finally, I am passionate in pedagogical aspects of undergraduate mathematics education.

Refer to my [website](#) for a full list of [projects](#), [talks](#), [conferences](#), [teaching](#), and [notes](#).

Education record

9/21 – 9/25	PhD Mathematics	<i>London School of Geometry and Number Theory</i>
	Supervised by Vladimir Dokchitser and Kevin Buzzard	
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

7/22 – 9/22	Research assistant at Huawei Technologies R&D UK Ltd
	Summer internship on formalisation of modern mathematics in automated theorem proving
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>

Research papers

- ?/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
Preprint submitted to the *Bulletin of the London Mathematical Society*
- 1/24 L-values of elliptic curves twisted by cubic characters
Preprint submitted to the *Canadian Journal of Mathematics*
- 7/23 An elementary formal proof of the group law on Weierstrass elliptic curves in any characteristic (joint with Junyan Xu)
Published in the *14th International Conference on Interactive Theorem Proving*

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

Selected talks

- 17/01/25 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
- 24/8/22 Formalisation of elliptic curves in Lean
Contributed talk for *Young Researchers in Algebraic Number Theory* in Glasgow
- 26/5/22 Elliptic curves and the Mordell–Weil theorem
Seminar talk for *London Learning Lean* in London
- 25/4/22 Elliptic curves in Lean
Workshop talk for *Huawei Technologies R&D UK Ltd* in Cambridge
- 4/12/20 Rank heuristics for elliptic curves
Seminar talk for *Part III Seminar Series* in Cambridge
- 13/9/19 Pairing-based elliptic curve cryptography
Presentation for *Adjoint UK Ltd* in London

Selected conferences

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|-------------|--|-------------------|
| 2–6/9/24 | Algebraic Number Theory | Munich |
| 31/7–2/8/24 | Young Researchers in Algebraic Number Theory | Oxford |
| 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

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|-------------|--|-------------------------------|
| 1/25 – 3/25 | Laboratory for <i>MATH60040 Formalising Mathematics</i> | ICL |
| 1/25 – 2/25 | Assistant for <i>London Maths Outreach</i>
Assisted in an introductory course on elliptic curves for sixth form students that spanned 4 weeks | UCL |
| 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 | Laboratory for <i>MATH60040 Formalising Mathematics</i> | ICL |
| 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 |
| 7/23 | Assistant for <i>Year 12 Maths Summer School: Logic and Proof</i>
Assisted in an introductory course on logic and proof for sixth form students that spanned 5 days | UCL |
| 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 |
| 3/23 | Teacher for <i>London Maths Outreach</i>
Designed a introductory course on elliptic curves for sixth form students that spanned 4 weeks | Harris Academy St John’s Wood |
| 1/23 – 3/23 | Tutorials and marking for <i>5CCM251A Discrete Mathematics</i> | KCL |

10/22 – 12/22	Marking for <i>MATH0022 Galois Theory</i>	<i>UCL</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>

Awards attained

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>
2020	Faculty of Engineering Dean's List	<i>ICL</i>
2018	Department of Mathematics UROP research studentship	<i>ICL</i>
2018	Faculty of Engineering Dean's List	<i>ICL</i>
2017	G Research Ltd Prize for academic excellence	<i>ICL</i>
2017	Faculty of Engineering Dean's List	<i>ICL</i>
2012 – 2015	Full 4-year school-based scholarship	<i>MOE Singapore</i>

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