

# David Kurniadi Angdinata

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## Research interests

I am interested in the computational aspects of the Birch and Swinnerton-Dyer conjecture for abelian varieties over global fields and their formalisation in the Lean theorem prover. Please refer to my [website](#) for more details on my [research](#), [activities](#), [events](#), [talks](#), and [other projects](#).

## Academic record

- 10.25 – 8.27 **Senior Research Associate** in the University of East Anglia  
Grant: Scalable theorem proving via mathematical databases
- 9.21 – 9.25 **PhD Mathematics** in the 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** in the University of Cambridge
- 10.16 – 6.20 **MEng Pure Mathematics and Computational Logic** in Imperial College London
- 1.14 – 12.15 **Singapore-Cambridge GCE A-level** in Temasek Junior College
- 1.12 – 12.13 **Singapore-Cambridge GCE O-level** in Anderson Secondary School

## Employment record

- 4.25 – 6.25 **Part-time Lean expert** in Harmonic
- 7.22 – 9.22 **Research assistant** in Huawei Technologies R&D UK Ltd
- 6.19 – 9.19 **Cryptography engineer** in Adjoint UK Ltd  
Developed and published the Haskell libraries `galois-field`, `elliptic-curve`, and `pairing`

## Research papers

- 1.26 Computing L-functions of  $\lambda$ -adic representations of global function fields  
Submitted to the *Seventeenth Algorithmic Number Theory Symposium*
- 5.25 On L-values of elliptic curves twisted by cubic Dirichlet characters  
In *Canadian Journal of Mathematics*
- 10.24 Algebraicity of Artin–Hasse–Weil L-series over global function fields  
Submitted to the *Bulletin of the London Mathematical Society*
- 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

\* 21 May 1997

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## Selected talks

- 13.1.26 A blueprint for the Birch and Swinnerton-Dyer conjecture in Lean  
数学机械化重点实验室 *Seminar* in Beijing (Online)
- 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 and British Applied Mathematics Colloquium* in Exeter
- 25.3.25 Teaching a computer algebraic number theory  
*Algebra, Number Theory, Logic and Representation Theory Seminar* in Norwich
- 3.3.25 Computing L-functions over global function fields  
Contributed talk for *Elliptic Curves in the Cotswolds* in Stonehouse
- 13.2.25 Algebraising foundations of elliptic curves  
*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  
*Formalising Algebraic Geometry* in Pasadena, CA (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  
*Linfot Number Theory Seminars* in Bristol
- 2.8.23 An elementary formal proof of the group law on Weierstrass elliptic curves in any characteristic  
*14th International Conference on Interactive Theorem Proving* in Białystok
- 26.5.22 Elliptic curves and the Mordell–Weil theorem  
*London Learning Lean* in London
- 25.4.22 Elliptic curves in Lean  
*Mathematical Theorem Proving Workshop* in Cambridge

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## Events organised

- 29.6–3.7.26 *Bridging Lean and the LMFDB*, event in Norwich  
Workshop organised by Chris Birkbeck and myself
- 22–25.7.24 *International Congress on Mathematical Software: Novel Formalisations of Mathematics in Lean*, event in Durham  
Conference session organised by Fangming Li, Amelia Livingston, Jujian Zhang, and myself

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## Selected conferences

- 26–27.1.26 *Lean 形式化数学学习强化和实践交流研讨会*, workshop in Beijing
- 19–21.11.25 *Lean Workshop 2025: Formalising Algebraic Geometry*, workshop in Heidelberg
- 3–5.9.25 *Young Researchers in Algebraic Number Theory*, conference in Nottingham
- 27.7–2.8.25 *Rational Points 2025*, conference in Schney
- 21–25.7.25 *Formalizing Class Field Theory*, workshop in Oxford
- 7–11.7.25 *LMFDB, Computation, and Number Theory*, conference in Providence, RI (Online)
- 10–14.3.25 *Diophantine and Rationality Problems*, conference in Sofia
- 2–6.9.24 *Algebraic Number Theory*, workshop in Munich
- 24–28.6.24 *Formalising Algebraic Geometry*, workshop in Pasadena (Online)
- 31.7–4.8.23 *14th International Conference on Interactive Theorem Proving*, conference in Białystok

\* 21 May 1997

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## Selected teaching

Spring 2026	Problems classes for <i>Year 1 MTHA4003B Real Analysis and Group Theory</i> in UEA
Spring 2026	Lectures for <i>Year 1 MTHA4007B Computation and Modelling</i> in UEA
Summer 2025	Supervisions for <i>Year 1 Term 3 research projects</i> in UCL Projects in Mordell's equation, Lean
Spring 2025	Problems classes for <i>Year 3 MATH60040 Formalising Mathematics</i> in Imperial
Summer 2024	Supervisions for <i>Year 1 Term 3 research projects</i> in UCL Projects in how to tell if a number is prime, group theory and Rubik's cube
Spring 2024	Tutorials for <i>Year 3 6CCM351A Representation Theory of Finite Groups</i> in KCL
Spring 2024	Lectures for <i>Year 2 MATH0034 Number Theory</i> in UCL
Summer 2023	Supervisions for <i>Year 1 Term 3 research projects</i> in UCL Projects in cryptography, sums of squares, the axiom of choice
Spring 2023	Tutorials for <i>Year 2 5CCM251A Discrete Mathematics</i> in KCL
Autumn 2022	Tutorials for <i>Year 2 5CCM224A Introduction to Number Theory</i> in KCL
Summer 2022	Supervisions for <i>Year 1 Term 3 research projects</i> in UCL Projects in continued fractions, cryptography, Lean
Autumn 2021	Tutorials for <i>Year 2 MATH0014 Further Linear Algebra</i> in UCL

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## Outreach activities

Spring 2025	<i>London Maths Outreach: Group Theory</i> in UCL A 4-week introductory course for sixth form students led by Alberto Centelles
Spring 2025	<i>London Maths Outreach: Rational Points and Elliptic Curves</i> in UCL A 4-week introductory course for sixth form students led by Jed Thorpe
Summer 2023	<i>Logic and Proof Summer School</i> in UCL A 5-day introductory course for sixth form students led by Nikoleta Kalaydzhieva
Spring 2023	<i>London Maths Outreach: Elliptic Curves</i> in Harris Academy St John's Wood A 4-week introductory course for sixth form students assisted by Ben Handley

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## Awards attained

2025 – 2026	LMS Early Career Fellowship (£10490, declined)
2024	MAPS Faculty Education Award 2024 for individual excellence (£500)
2021 – 2025	Full funding for 4-year PhD research [EP/S021590/1]
2020	Governors' MSci JMC Prize for best overall performance in final year (£500)
2020	Donald Davies Prize for best final year individual project (£500)
2018	Department of Mathematics UROP research studentship (£1200)
2017	G Research Ltd Prize for academic excellence (£500)
2017 – 2020	Faculty of Engineering Dean's List (2017, 2018, 2020)
2012 – 2015	MOE Full 4-year school-based scholarship

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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

\* 21 May 1997