

David Kurniadi Angdinata

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 λ -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

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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
Linfoot 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

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

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

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Selected teaching

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

Outreach activities

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

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

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

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✉ +44 7551 733331 • 📩 jrv25shu@uea.ac.uk • 🌐 multramate.github.io
👤 Multramate • 🌐 <https://github.com/Multramate>