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

Computing L-functions of λ-adic representations over global function fields
Preprint in preparation

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*
+44 7551 733331 • *jrv25shu@uea.ac.uk* • *multramate.github.io*
https://github.com/Multramate

Selected talks

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

19–21.11.25 *Lean Workshop 2025: Formalising Algebraic Geometry*, workshop in Heidelberg

9–12.9.25 *Algebraic and Geometric Methods for Diophantine Problems*, conference in Pisa

3–5.9.25 *Young Researchers in Algebraic Number Theory*, conference in Nottingham

27.7–2.8.25 *Rational Points 2025*, conference in Schney

25–26.7.25 *Magma Meeting: Rational Points 2025*, workshop in Würzburg

21–25.7.25 *Formalizing Class Field Theory*, workshop in Oxford

14–18.7.25 *LMFDB Workshop*, workshop in Cambridge, MA (Online)

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*
+44 7551 733331 • *jrv25shu@uea.ac.uk* • *multramate.github.io*
https://github.com/Multramate

Selected teaching

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
Spring 2025	Problems classes for *Year 1 MATH40003 Linear Algebra and Groups* 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 Kalaydzhieva
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
2012 – 2018	Solved 180 Project Euler problems primarily in Java and Haskell

✱ *21 May 1997*
+44 7551 733331 • *jrv25shu@uea.ac.uk* • *multramate.github.io*
https://github.com/Multramate