

Ronald van Luijk

Curriculum Vitae

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Mathematisch Instituut
PO Box 9512
2300 RA Leiden
the Netherlands

Phone : +31 71 5277147
Fax : +31 71 5277111
<http://www.math.leidenuniv.nl/~rvl>
rvl@math.leidenuniv.nl

Affiliations

- 2014– **Universiteit Leiden**, the Netherlands (associate professor)
- 2008–2014 **Universiteit Leiden**, the Netherlands (assistant professor)
- 2012 (Fall) **École Polytechnique Fédérale de Lausanne (EPFL)**, Switzerland
- 2012 (Sum.) **Centre Interfacultaire Bernoulli (CIB), EPFL**, Lausanne, Switzerland (visiting professor)
- 2008 **Warwick University**, Coventry, United Kingdom
- 2006–2008 **Pacific Institute for the Mathematical Sciences (PIMS), SFU/UBC**, Vancouver, Canada
- 2007 (Sum.) **Jacobs University Bremen, International Center for Transdisciplinary Studies**, Germany
- 2006 (Fall) **Universidad de los Andes**, Bogotá, Colombia (visiting professor)
- 2006 (Spr.) **Mathematical Sciences Research Institute (MSRI)**, Berkeley, USA
- 2005 (Fall) **Centre de Recherches Mathématiques (CRM)**, Montréal, Canada
- 2004 (Fall) **Institut Henri Poincaré (IHP)**, Paris, France

Education

- 2005.05 **University of California at Berkeley**, USA
Ph.D. in Mathematics (advisor : H.W. Lenstra, Jr.)
Thesis title: *Rational points on K3 surfaces*
- 2000.06 **Universiteit Utrecht**, the Netherlands
Doctoraalexamen in Mathematics (cum laude)
Thesis title: *On perfect cuboids* (advisors: F. Beukers and B. Moonen)
- 1996 **Universiteit Utrecht**, the Netherlands
Propedeuse in Mathematics (cum laude)
Propedeuse in Computer Science (cum laude)

Grants

- 2017 NWO Visitor grant for Nils Bruin
- 2012–2018 Vidi grant, NWO, Innovational Research Incentives Scheme
Counting points on surfaces
- 2012–2016 International Research Training Group, Berlin–Amsterdam–Leiden, NWO/DFG
Moduli and Automorphic Forms: Arithmetic and Geometric Aspects
- 2012–2013 DIAMANT support for postdoc (Rachel Newton)
- 2008– Various supporting grants for organized conferences
- 2007 Marie-Curie fellowship, University of Warwick
- 2006 PIMS postdoctoral fellowship, UBC/SFU, Vancouver
- 2006 Three year fellowship from Deutsche Forschungsgemeinschaft (DFG) (declined)
- 2000–2001 Talentenprogramma fellowship (NUFFIC)

Awards

- 2007 G. de B. Robinson Award for best paper in the Canadian Mathematical Bulletin
- 2003 Outstanding Graduate Student Instructor Teaching Award, UC Berkeley
- 1998 Timman prize for exceptional solution to the “Universitaire Wiskundecompetitie” (University Mathematical Competition for undergraduates in The Netherlands and Flanders)
- 1997–2000 First place in “Universitaire Wiskundecompetitie” (see above)
- 1996 Fourth place in “Universitaire Wiskundecompetitie” (see above)
- 1994, 1995 Bronze medal at International Mathematical Olympiad (IMO)

Peer-reviewed articles

1. Finiteness theorems for K3 surfaces over arbitrary fields (with M. Bright and A. Logan) accepted by *European Journal of Mathematics* (2019), arXiv:1810.04905, 24pp
2. Unirationality of del Pezzo surfaces of degree two over finite fields (with D. Festi) *Bulletin of the London Mathematical Society*, Volume 48 (2016), 135–140
3. Computing Néron–Severi groups and cycle class groups (with B. Poonen and D. Testa) *Compositio Mathematica*, Volume 151 (2015), no. 4, 713–734
4. Density of rational points on Del Pezzo surfaces of degree one (with C. Salgado) *Advances in Mathematics*, Volume 261 (2014), 154–199
5. Explicit Selmer groups for cyclic covers of \mathbb{P}^1 (with M. Stoll) *Acta Arithmetica*, Volume 159 (2013), 133–148
6. The Cayley–Oguiso automorphism of positive entropy on a K3 surface (with D. Festi, A. Garbagnati, and B. van Geemen) *Journal of Modern Dynamics*, Volume 7, No. 1 (2013), 75–97
7. Density of rational points on elliptic surfaces *Acta Arithmetica*, Volume 156, no. 2 (2012), 189–199
8. Squares from blocks of consecutive integers: a problem of Erdős and Graham (with M.A. Bennett) *Indagationes Mathematicae*, Volume 23 (2012), 123–127
9. Two-coverings of Jacobians of curves of genus two (with D. Testa and V. Flynn) *Proceedings of the London Mathematical Society*, Volume 104, no. 2 (2012), 387–429
10. Cubics points on cubic curves and the Brauer–Manin obstruction for K3 surfaces *Acta Arithmetica*, Volume 146, no. 2 (2011), 153–172
11. On character varieties of two-bridge knot groups (with M. Macasieb and K. Petersen) *Proceedings of the London Mathematical Society*, Volume 103, no. 2 (2011), 473–507
12. Wehler K3 surfaces with Picard number 3 and 4
Appendix to: Orbits of points on certain K3 surfaces, by Arthur Baragar
Journal of Number Theory, Volume 131, Issue 3 (2011), 600–603
13. Lines on Fermat surfaces (with M. Schütt and T. Shioda) *Journal of Number Theory*, Volume 130 (2010), 1939–1963
14. Density of rational points on diagonal quartic surfaces (with A. Logan and D. McKinnon) *Algebra and Number Theory*, Volume 4, No. 1 (2010), 1–20
15. Nontrivial elements of Sha explained through K3 surfaces (with A. Logan) *Mathematics of Computation*, Volume 78 (2009), 441–483
16. Non-Euclidean Pythagorean triples, a problem of Euler, and rational points on K3 surfaces *Mathematical Intelligencer*, Volume 30, No. 4 (2008), 4–10 (with R. Hartshorne)
17. The diameter of the circumcircle of a Heron triangle *Elemente der Mathematik*, Volume 63, Issue 3 (2008), 118–121
18. K3 surfaces with Picard number one and infinitely many rational points *Algebra and Number Theory*, Volume 1, No. 1 (2007), 1–15
19. K3 surfaces with Picard number three and canonical vector heights (with A. Baragar) *Mathematics of Computation*, Volume 76 (2007), 1493–1498
20. An elliptic K3 surface associated to Heron triangles *Journal of Number Theory*, Volume 123 (2007), 92–119
21. A K3 surface associated with certain integral matrices with integral eigenvalues *Canadian Mathematical Bulletin*, Volume 49, No. 4 (2006), 560–577
22. Quartic K3 surfaces without nontrivial automorphisms *Mathematical Research Letters*, Volume 13, No. 3 (2006), 423–439

Non-peer-reviewed publications

1. NMC Nieuwe stijl
Nieuw Archief voor Wiskunde (5), Volume 16, No. 2 (2015), 130–132
2. Two-coverings of Jacobians
Oberwolfach Reports (OWR), Explicit Methods in Number Theory (2009)
3. The Manin conjecture for K3 surfaces
Oberwolfach Reports (OWR), EMNT (2007)
4. Explicit computations on the Manin conjectures
Oberwolfach Reports (OWR), EMNT (2005)
5. A linear algebra exercise (with F. Beukers and R. Vidunas)
Nieuw Archief voor Wiskunde (5), Volume 3, No. 2 (2002), 139–140
6. Hex, dots and boxes (with S. van Rijnsouw, book report)
Nieuw Archief voor Wiskunde (5), Volume 2, No. 4 (2001), 358–361
7. Wiskunde Olympiade (with J. van de Craats and T. Notenboom)
Nieuw Archief voor Wiskunde (5), Volume 1, No. 4 (2000), 448–450

Preprints, and books and papers in preparation

1. The action of the Weyl group on the E8 root system (with R. Winter)
submitted, arXiv:1901.06945, 55+19pp
2. Rational points on del Pezzo surfaces of degree one (with J. Bulthuis, in preparation)
3. Concurrent lines on del Pezzo surfaces of degree one (with R. Winter, in preparation)
4. Extending isomorphisms of subgraphs to automorphisms (with R. Winter, in preparation)
5. Geometry and arithmetic of surfaces (with M. Bright and D. Testa, book in preparation)
6. Linear Algebra 1 (with M. Stoll, book in preparation)
7. Linear Algebra 2 (with M. Stoll, book in preparation)

Students and postdocs

Postdocs

- 2015–2017 Efthymios Sofos, Leiden
2012–2014 David Holmes, Leiden
2012–2014 Rachel Newton, Leiden
2009–2011 Cecília Salgado, Leiden

Ph.D. students

- 2020 (exp.) Rosa Winter, Leiden, co-advisor Martin Bright
2018 Erik Visse, *Counting points on K3 surfaces and other arithmetic-geometric objects*, Leiden
2017 Niels Lindner, *Hypersurfaces with defect and their densities over finite fields*,
Berlin/Leiden, main advisor Remke Kloosterman
2016 Yan Zhao, *Deformations of nodal surfaces*,
Algant Leiden/Milano, main advisor Bert van Geemen
2016 Dino Festi, *Topics in the arithmetic of del Pezzo and K3 surfaces*,
Algant Leiden/Milano, co-advisor Bert van Geemen
2013 René Pannekoek, *Topological aspects of rational points on K3 surfaces*, Leiden

Master students

- 2019 (exp.) Erik Massop, Leiden
2018 Jelle Bulthuis, *Rational points on del Pezzo surfaces of degree one*, Leiden
2016 Arthur Bik, *The varieties of e-th powers*, Leiden
2014 Rosa Winter, *Concurrent exceptional curves on del Pezzo surfaces of degree one*, Leiden
2014 Erik Visse, *Local computations on the Cassels–Tate pairing on an elliptic curve*, Leiden

- 2012 Dino Festi, *Density of rational points on a family of diagonal quartic surfaces*, Leiden
 2011 Davide Calliari, *Reconstruction of cubic surfaces*, Leiden
 2006 Enrique Acosta, *Rational tetrahedra*, Bogotá

Bachelor students

- 2019 (exp.) Nada Sisan, *Gröbner bases en Euclidische meetkunde*, Leiden
 2019 (exp.) Patrick Stok, *Computing the dimension of a variety with Gröbner bases*, Leiden
 2019 (exp.) Patrick Berkhoff, *Graphical Calculation of the Pfaffian*, Leiden, co-advisor Owen Biesel
 2019 (exp.) Joep Veenman, *The mathematics of juggling*, Leiden
 2018 Anneloes Viergever, *Two cases of Fermat's Last Theorem using descent on elliptic curves*, Leiden
 2016 Tim Brouwer *Solving an arbitrary permutation puzzle*, Leiden
 2016 Ingela Mennema, *Roosters*, Leiden, co-advisor Erik Visse
 2014 Arthur Bik, *Elliptic curves with high rank*, Delft
 2012 Ellen Schlebusch, *Het Hasse-principe*, Leiden
 2012 Erik Massop, *Hilbert's tenth problem*, Leiden
 2011 Remy van Dobben de Bruyn, *The modularity theorem*, Leiden, co-advisor Cecília Salgado
 2010 Wouter Zomervrucht, *De complexiteit van Buchbergers algoritme*, Leiden
 2009 Youssef Achnine, *Rationale tetraëders*, Leiden

Ph.D. defense committees

- 2019.3 Anna Somoza Henares, *Inverse Jacobian and related topics for certain superelliptic curves*, Leiden
 2018.10 Raymond van Bommel, *Models of curves: the Birch and Swinnerton-Dyer conjecture & ordinary reduction*, Leiden
 2018.5 Eduardo Ruiz Duarte, *Hasse-Weil Inequality and Primality Tests in the context of Curves of Genus 2*, Groningen
 2017.11 Martin Djukanović, *Split Jacobians and Lower Bounds on Heights*, Leiden
 2017.9 Mima Stanojkovski, *Intense automorphisms of finite groups*, Leiden
 2017.1 Jinbi Jin, *Computability of the étale Euler-Poincaré characteristic*, Leiden
 2016.5 Florian Bouyer, *A Study of Quartic K3 Surfaces with a $(\mathbb{Z}/2\mathbb{Z})^4$ Action*, viva Warwick
 2015.12 Weidong Zhuang, *Symmetric Diophantine approximation over function fields*, Leiden
 2015.09 Athanasios Angelakis, *Universal Adelic groups for imaginary quadratic number fields and elliptic curves*, Leiden
 2014.06 Michiel Kosters, *Groups and fields in arithmetic*, Leiden
 2013.10 Chao Zhang, *G-zips and Ekedahl-Oort Strata for Hodge Type Shimura Varieties*, Leiden
 2013.10 Samuele Anni, *Images of Galois representations*, Leiden
 2013.09 Andrea Siviero, *Class invariants for tame Galois algebras*, Leiden
 2011.12 Bas Heijne, *Elliptic Delsarte surfaces*, Groningen
 2011.06 Arjen Stolk, *Discrete tomography for integer-valued functions*, Leiden
 2010.06 Marco Streng, *Complex multiplication of abelian surfaces*, Leiden
 2009.12 Jos Brakenhoff, *Counting problems for number rings*, Leiden

Organized meetings

- 2018.04 *Nederlands Mathematisch Congres (NMC)*, Veldhoven (program committee)
 2015.04 *Nederlands Mathematisch Congres (NMC)*, Leiden (chair of organising committee)
 2011.11 *Criptografía*, Universidad de los Andes, Colombia (Master student workshop)
 2010.10 *Arithmetic of surfaces*, Lorentz center, Leiden (conference)
 2009.04 *Hendrik Lenstra's 60th birthday*, Leiden
 2009.04 *Counting points on varieties*, Lorentz center, Leiden (conference)
 2009.04 *Counting points on varieties*, Lorentz center, Leiden (Ph.D. student workshop)
 2009.02 *Norm residue symbols*, Leiden (workshop)
 2008.12 *Arithmetic of K3 surfaces*, Banff International Research Station, Canada (conference)
 2008.10 *The Hasse principle*, Universidad de los Andes, Colombia (Master student workshop)
 2008.04 *Surfaces: geometry and arithmetic*, University of Warwick (Ph.D. student workshop)
 2006.10 *Number theory in cryptography*, Universidad de los Andes, Colombia (Master student workshop)

Lecture Series

- 2016.04 *The geometry of del Pezzo surfaces*, Higher School of Economics (HSE), Moscow (3 lectures)
- 2011.11 *Criptografía*, Universidad de los Andes, Colombia (4 lectures)
- 2009.04 *Batyrev–Manin conjecture*, Lorentz center, Leiden (4 lectures)
- 2008.10 *The Hasse principle*, Universidad de los Andes, Colombia (4 lectures)
- 2008.04 *Arithmetic and geometry of surfaces: Brauer–Manin obstructions*, University of Warwick, United Kingdom (5 lectures)
- 2006.10 *Cryptography in number theory*, Universidad de los Andes, Colombia (5 lectures)
- 2004, 2005 *Freshmen Preparation Bootcamp* (Summer), UC Berkeley’s Multicultural Engineering Program

Invited Conference Talks

- 2018.07 Recent progress in the arithmetic and geometry of K3 surfaces, **Trento**
- 2018.05 Rational and Integral Points via Analytic and Geometric Methods, **Oaxaca**
- 2015.11 Moduli Spaces and Arithmetic Geometry (Frans Oort 80), **Leiden**
- 2015.05 Pontos Racionais, **Rio de Janeiro**
- 2014.12 Foundations of Computational Mathematics, **Montevideo**
- 2014.05 Theoretical and Practical Aspects of the Discrete Logarithm Problem, **Ascona**
- 2013.05 Rational Points–Geometric, Analytic and Explicit Approaches, **Warwick**
- 2013.02 Brauer groups and obstruction problems: moduli spaces and arithmetic, **Palo Alto**
- 2013.02 Nationale Wiskunde Dagen, **Noordwijkerhout**
- 2012.02 Workshop on algebraic surfaces, **Hannover**
- 2012.01 Joint Mathematics Meetings, AMS Special Session on Rational Points on Varieties, **Boston**
- 2010.05 Rational Points – Theory & Experiment, **Zürich**
- 2010.03 Arithmetic aspects of elliptic surfaces, HIM, **Bonn**
- 2010.02 Algebraic Geometry in Characteristic p and Related Topics, Hosei Univ., **Tokyo**
- 2009.09 Arithmetic and algebraic geometry of higher-dimensional varieties, **Bristol**
- 2009.09 3rd Annual Meeting – GTEM (Galois Theory and Explicit Methods), **Warwick**
- 2009.07 Explicit Methods in Number Theory, **Oberwolfach**
- 2008.10 Arithmetic of K3 surfaces, BIRS, **Banff**
- 2008.07 Canadian Number Theory Association meeting (CNTA X), **Waterloo**
- 2008.06 Dynamique et surfaces K3, **Rennes**
- 2008.06 Rational Points on Curves and Higher Dimensional Varieties, **Warwick**
- 2008.06 Foundations of Computational Mathematics (FoCM 6), **Hong Kong**
- 2007.07 Rational Points on Curves and Higher-Dimensional Varieties: Theory and Explicit Methods, **Bremen**
- 2007.07 Explicit Methods in Number Theory, **Oberwolfach**
- 2007.02 Explicit Methods for Rational Points on Curves, BIRS, **Banff**
- 2007.02 10th International Workshop on Differential Equations, Number Theory, Data Analysis Methods and Geometry, **Havana**
- 2006.07 Canadian Number Theory Association meeting (CNTA IX), **Vancouver**
- 2006.05 Analytic Methods for Diophantine Equations, BIRS, **Banff**
- 2006.01 Joint Mathematics Meetings, AMS Special Session on Field Extensions and Algorithms, **San Antonio**
- 2005.10 Arithmetic and Geometry of Higher Dimensional Varieties with Special Emphasis on Calabi-Yau Varieties and Mirror Symmetry, Fields Institute, **Toronto**
- 2005.07 Explicit Methods in Number Theory, **Oberwolfach**
- 2005.04 The Pacific North West Number Theory Conference 9, **Vancouver**
- 2004.11 Explicit Methods in Number Theory, BIRS, **Banff**
- 2004.10 Arithmetic Geometry, IHP, **Paris**

Seminar and colloquium talks

- 2016.06 Department colloquium, **VU Amsterdam**
- 2016.03 Intercity Number Theory Seminar, **UvA Amsterdam**
- 2013.10 Oberseminar für algebraische Geometrie und Arithmetik, **Essen**
- 2013.05 Séminaire “Variétés rationnelles”, ENS, **Paris**
- 2013.02 Department colloquium, **Utrecht**
- 2013.02 Algebraic geometry seminar, **Cambridge**
- 2012.12 Algebraic geometry seminar, **Zürich**
- 2012.10 Rational Points and Algebraic Cycles seminar, **Lausanne**
- 2012.05 Intercity seminar number theory, **Leiden**
- 2011.11 Algebra seminar, **Bogotá**
- 2011.05 Séminaire “Variétés rationnelles”, ENS, **Paris**
- 2011.03 Intercity seminar number theory, **Amsterdam**
- 2010.11 Number theory seminar, **Cambridge**
- 2010.04 Intercity seminar number theory, **Leiden**
- 2009.09 Intercity seminar number theory, **Eindhoven**
- 2009.06 Forschungsseminar “Arithmetische Geometrie”, **Berlin**
- 2009.05 Department colloquium, **Leiden**
- 2008.11 Algebra seminar, **Leiden**
- 2008.10 Department colloquium, Universidad de los Andes, **Bogotá**
- 2008.09 Intercity seminar number theory, **Leiden**
- 2008.05 Heilbronn number theory seminar, **Bristol**
- 2008.05 Number theory seminar, **Oxford**
- 2008.05 Number theory seminar, **Berkeley**
- 2008.04 Number theory seminar, **Warwick**
- 2008.02 SFU/UBC Number theory Seminar, **Vancouver**
- 2008.02 Algebraic geometry seminar, UBC, **Vancouver**
- 2007.10 Intercity seminar number theory, CWI, **Amsterdam**
- 2007.09 SFU/UBC Number theory seminar, **Vancouver**
- 2007.06 Number theory seminar, **Bristol**
- 2007.05 Intercity seminar number theory, **Leiden**
- 2007.01 Number theory seminar, **Berkeley**
- 2007.01 SFU/UBC Number theory seminar, **Vancouver**
- 2006.09 Department colloquium, Universidad de los Andes, **Bogotá**
- 2006.05 Number theory seminar, **San Diego**
- 2006.03 MSRI, **Berkeley**
- 2006.02 Number theory seminar, **Austin**
- 2005.10 Number theory seminar, Boston University, **Boston**
- 2005.10 Québec–Vermont seminar series, **Montréal**
- 2005.10 Department colloquium, Queen’s University, **Kingston**
- 2005.10 Number theory seminar, Queen’s University, **Kingston**
- 2005.03 Intercity seminar number theory, **Groningen**
- 2005.02 Number theory seminar, **Harvard**

Teaching

National mastermath courses (Netherlands)

2013, Fall	Rational points on varieties
2011, Fall	Elliptic curves
2009, Fall	Elliptic curves

Universiteit Leiden

2019, Spring	Algebra 1 (group theory)
2018, Fall	Linear algebra 2
2018, Spring	Algebra 1 (group theory)
2017, Fall	Linear algebra 2
2017, Spring	Algebra 3 (Galois theory)
2016, Fall	Linear algebra 2
2015, Fall	Linear algebra 1
2015, Fall	Linear algebra 2
2014, Fall	Linear algebra 1
2014, Fall	Linear algebra 2
2014, Spring	Calculus
2013, Fall	Linear algebra 1
2013, Spring	Algebra 1 (group theory)
2013, Spring	Bachelor seminar
2012, Spring	Bachelor seminar
2011, Fall	Linear algebra 1
2011, Spring	Local fields
2011, Spring	Algebra 1
2011, Spring	Bachelor seminar
2010, Fall	Linear algebra 1
2010, Spring	Bachelor seminar
2009, Fall	Linear algebra 1
2009, Spring	Bachelor seminar
2008, Fall	Linear algebra 1

Universidad de los Andes

2006, Fall	Elliptic curves
2006, Fall	Calculus

University of California at Berkeley

2005, Spring	Calculus (Professional Development Program)
2004, Summer	Calculus (Lecturer)
2003, Fall	Calculus (Professional Development Program)
2003, Spring	Calculus (Professional Development Program)
2002, Fall	Linear algebra (Graduate Student Instructor)
2002, Summer	Discrete mathematics (Lecturer)
2001, Fall	Calculus (Professional Development Program)
2001, Spring	Calculus (Graduate Student Instructor)

Broader impact

2018	Speaker at Science Family Day on juggling
2017	Guide for the exhibition “Imaginary” in Leiden
2011	Chief Coordinator (grading) International Mathematical Olympiad (IMO) 2011
2011	Member of the Problem Selection Committee for IMO 2011
2010	Chief Coordinator Benelux Mathematical Olympiad
2004–2013	Editor of problem section of “Nieuw Archief voor Wiskunde”
1996–2001	Trainer of the Dutch team for the International Mathematical Olympiad
1999–2001	Deputy leader of the Dutch team at the International Mathematical Olympiad
1996–2000	Editor of problem section in Dutch mathematical magazine “Pythagoras” for high school students
1996	Leader of a mathematics summer camp for high school students for Stichting Vierkant