Curriculum vitae of Robin de Jong

Personal data

Full name:	Robin Sander de Jong
Date of birth:	June 26, 1976, Vlaardingen, The Netherlands
Citizenship:	Dutch
Address:	Mathematisch Instituut PO Box 9512 2300 RA Leiden The Netherlands
Phone:	+31 71 527 71 40
Homepage:	http://www.math.leidenuniv.nl/∼rdejong

Positions held

- Assistant professor, U Leiden, 2007–.
- Postdoc, U Leiden, 2005–2006.

Personal grants

- TOP grant, compartiment 2 (209 kE), NWO, 2015.
- VENI grant (208 kE), NWO, 2006.

Relevant diplomas

- Basiskwalificatie Onderwijs (BKO), 2011.
- PhD, U Amsterdam, 2004.
- MSc Philosophy, U Leiden, 2001.
- MSc Mathematics, U Leiden, 1999.

Visits abroad (two months or longer)

- Max Planck Institut für Mathematik, Bonn, Spring 2009.
- Mittag-Leffler Institute, Stockholm, Spring 2007.
- Institut des Hautes Etudes Scientifiques, Paris, Fall 2004.

Publications in journals

- *On the height of Gross-Schoen cycles in genus three.* To appear in Research in Number Theory.
- *Chern-Weil theory for line bundles with the family Arakelov metric.* To appear in Michigan Mathematical Journal (joint with Michiel Jespers).
- *Faltings delta-invariant and semistable degeneration.* To appear in Journal of Differential Geometry.
- *Néron-Tate heights of cycles on jacobians.* Journal of Algebraic Geometry 27 (2018), 339–381.
- *Néron models and the height jump divisor.* Transactions of the AMS 369 (2017), 8685–8723 (joint with O. Biesel and D. Holmes).
- *Positivity of the height jump divisor.* International Mathematics Research Notices, rnx169, https://doi.org/10.1093/imrn/rnx169 (joint with J. Burgos Gil and D. Holmes).
- *Singularities of the biextension metric for families of abelian varieties.* To appear in Forum of Mathematics, Sigma (joint with J. Burgos Gil and D. Holmes).
- *Point-like limit of the hyperelliptic Zhang-Kawazumi invariant.* Pure and Applied Mathematics Quarterly 11 (2015), 633–653.
- *Asymptotics of the Néron height pairing*, Mathematical Research Letters 22 (2015), 1337–1371 (joint with D. Holmes).
- *Canonical heights and division polynomials*, Mathematical Proceedings of the Cambridge Philosophical Society 157 (2014), 357–373 (joint with J. S. Müller).
- *Asymptotic behavior of the Kawazumi-Zhang invariant for degenerating Riemann surfaces*, Asian Journal of Mathematics 18 (2014), 507–524.
- *Normal functions and the height of Gross-Schoen cycles*, Nagoya Mathematical Journal 214 (2014), 53–77.
- *Second variation of Zhang's λ-invariant on the moduli space of curves*, American Journal of Mathematics 135 (2013), 275–290.
- *Special values of canonical Green's functions*, Mathematische Zeitschrift, DOI 10.1007/s00209-012-1064-2.
- *Local heights on Galois covers of the projective line*, Acta Arith. 152 (2012), 51–70.
- *Conjecture de Shafarevitch effective pour les revêtements cycliques*, Algebra and Number Theory 5 (2011), 1133–1143 (joint with G. Rémond).
- *One half log discriminant and division polynomials*, Archiv der Mathematik 97 (2011), 251–257.
- *Symmetric roots and admissible pairing*, Transactions of the American Mathematical Society 363 (2011), 4263–4283.
- *Covers of surfaces with fixed branch locus*, International Journal of Mathematics 21 (2010), 859–874 (joint with B. Edixhoven and J. Schepers).

- *Admissible constants for genus two curves*, Bulletin of the London Mathematical Society 42 (2010), 405–411.
- *Theta functions on the theta divisor*, Rocky Mountain Journal of Mathematics 40 (2010), 155–176.
- *Local invariants attached to Weierstrass points*, Manuscripta Mathematica 129 (2009), 273–292.
- *Explicit Mumford isomorphism for hyperelliptic curves*, Journal of pure and applied Algebra 208 (2007), 1–14.
- *On the Arakelov theory of elliptic curves*, l'Enseignement Mathématique 51 (2005), 179–201.
- *Arakelov invariants of Riemann surfaces*, Documenta Mathematica 10 (2005), 311–329.

Contributions to books

- *Torus bundles and 2-forms on the universal family of Riemann surfaces*, in: A. Papadopoulos (ed.), Handbook of Teichmüller theory, Volume VI. EMS Publishing House 2016.
- *Short introduction to heights and Arakelov theory*, in: J.-M. Couveignes, B. Edixhoven (eds.), Computational aspects of Modular Forms and Galois Representations. Annals of Mathematics Studies 176, Princeton University Press 2011 (joint with B. Edixhoven).
- *Applying Arakelov theory*, in: J.-M. Couveignes, B. Edixhoven (eds.), Computational aspects of Modular Forms and Galois Representations. Annals of Mathematics Studies 176, Princeton University Press 2011 (joint with B. Edixhoven).
- *Bounds for Arakelov invariants of modular curves*, in: J.-M. Couveignes, B. Edixhoven (eds.), Computational aspects of Modular Forms and Galois Representations. Annals of Mathematics Studies 176, Princeton University Press 2011 (joint with B. Edixhoven).
- *Gauss map on the theta divisor and Green's functions*, in: B. Edixhoven, G. van der Geer, B. Moonen (eds.), Modular Forms on Schiermonnikoog, Cambridge University Press 2008.
- *Faltings' delta-invariant of a hyperelliptic Riemann surface*, in: G. van der Geer, B. Moonen, R. Schoof (eds.), Number Fields and Function Fields: Two Parallel Worlds. Progress in Mathematics vol. 239, Birkhäuser Verlag 2005.

Books edited

- *Geometry and Arithmetic*, C. Faber, G. Farkas, R. de Jong (eds.), EMS Series of Congress Reports, EMS Publishing House 2012.

PhD thesis

- *Explicit Arakelov geometry*, PhD thesis, U Amsterdam, December 2004.

PhD students (co-)supervised

- S. van der Lugt (expected 2019).

- E. Martinez (2018, with A. Schmitt, FU Berlin).
- U. Doğan (2018, with E. Große-Klönne, Humboldt U Berlin).
- N. Damjanovic (2018, with V. Koziarz, U Bordeaux).
- M. Djukanovic (2017, with F. Pazuki, U Bordeaux). Now postdoctoral student at U Ulm.
- A. Botero (2017, with J. Kramer, Humboldt U Berlin). Now postdoctoral student at TU Darmstadt.
- A. Javanpeykar (2013, with B. Edixhoven, U Leiden and J.-B. Bost, U Paris-Sud/Orsay). Now Juniorprofessor at U Mainz.
- P. Bruin (2010, with B. Edixhoven, U Leiden). Now assistant professor at U Leiden.

Master theses supervised (available at https://www.universiteitleiden.nl/en/science/mathematics/education/theses)

- D. Becker (2018), *Heights in Arakelov geometry.*
- J. W. van Beek (2018), *The cup product.*
- H. Wang (2017), *Two-variable zeta functions and their properties through covers.*
- J. Hekking (2017), *Segal objects in homotopical categories and K-theory of proto-exact categories* (with I. Moerdijk).
- F. Giovenzana (2016), *On the canonical key formula.*
- M. Jespers (2016). *An analogue of Chern-Weil theory for the line bundle of weak Jacobi forms on a non-compact modular surface.*
- S. van der Lugt (2015), *Arakelov intersection theory applied to torsors of semi-stable elliptic curves.*
- S. Zarabara (2015), *Étale cohomology over* $\mathrm{Spec}(k)$.
- H. Rohrbach (2014), *The geometry of the Gauss map and moduli of abelian varieties.*
- C. Panda (2013), *Néron local height functions for elliptic curves.*
- J. Commelin (2013), *Algebraic cycles, Chow motives, and L-functions.*
- V. Zakharevich (2012), *Mixed intermediate jacobians.*
- S. Pouwelse (2012), *Bounds on cohomology by stratifications.*
- Y. Achnine (2011), *On the main conjecture on algebraic geometric MDS codes.*
- D. Calliari (2011), *Reconstruction of cubic surfaces* (with R. van Luijk).
- N. Sambin (2010), *Geometric constructions of the irreducible representations of* $GL_n(\mathbb{C})$.
- H. Chang (2010), *Asymptotically good generalized algebraic geometry codes.*
- A. Mohajer (2008), *Algebraic and analytic multiplier ideals and applications.*
- R. Jurrius (2008), *Classifying polynomials of linear codes* (with R. Pellikaan).
- A. Aryasomayajula (2007), *Average height of isogenous abelian varieties.*

- P. Bruin (2006), *Green functions on Riemann surfaces and an application to Arakelov theory* (with B. Edixhoven).

Bachelor theses supervised (available at https://www.universiteitleiden.nl/en/science/mathematics/education/theses)

- N. van der Steen (2018), *Dessins d'enfants.*
- S. Maibach (2018), *Actuating deterministic spin systems* (with M. van Hecke).
- D. Godding (2017), *The effective resistance.*
- J.-W. van Beek (2015), *De stelling van Borsuk-Ulam.*
- M.P. Noordman (2014), *G-bundles, Cech cohomology and the fundamental group.*
- J. Hekking (2014), *Belyi pairs, dessins d'enfants and hypermaps.*
- N. Schoots (2013), *A categorical approach to varieties over k.*
- O. Jaïbi (2013), *Gaussian curvature and the Gauss-Bonnet theorem.*
- S. van der Lugt (2012), *Projectieve vlakken.*
- H. Rohrbach (2011), *De sluitstelling van Poncelet.*
- R. Wols (2010), *Eindige topologische ruimten.*
- R. Hoogwater (2010), *Potentieel goede reductie van elliptische krommen met een gegeven periodenrooster.*
- S. van Lieshout (2009), *Zariski topology vs. strong topology.*
- M. Kosters (2008), *Schubert calculus.*
- R. Jurrius (2005), *Algebraïsche topologie en de Lefschetz fixpuntstelling.*

Pre-University College theses supervised

- E. Nandorfí, J. Wagenaar (2009), *On elliptic curves and Mordell's theorem.*
- J. Groeneweg, L. Meekes (2009), *Binaire codes.*
- J. Leuven, L. van Steijn (2008), *Bewaakte polygonen.*
- S. Polak, T. Rijken (2008), *De abc-stelling voor polynomen met complexe coëfficiënten.*
- T. Foppen, N. Goet, K. de Jong (2007), *De gulden snede.*
- H. Rohrbach, T. van der Peet (2006), *Elliptische krommen.*
- J. Hootsmans, C. Schoenbach (2005), *Twee vreemde ruimtevullers.*

Courses taught (contents available via http://www.math.leidenuniv.nl/∼rdejong/)

- Algebraic Geometry 2 (mastermath), Spring 2018.
- Lineaire Algebra voor Informatica en Economie (linear algebra), Fall 2015, 2016.
- Bachelor seminar Algebra, meetkunde en getaltheorie, Spring 2015, 2016, 2017, 2018.
- Advanced Algebraic Geometry (WONDER/mastermath), Fall 2014.

- Continue Wiskunde voor Informatica en Economie (calculus), Fall 2014, 2015, 2016.
- Algebraic Geometry (mastermath), Spring 2012, 2014, 2016, Fall 2016.
- Calculus A (chemistry students), Fall 2012.
- Wiskundige Structuren (mathematical structures), Fall 2012, 2013.
- Reading course Complex Geometry, Spring 2012.
- Reading course Intersection Theory, Spring 2012.
- Introduction to Algebraic Topology, Fall 2011, 2013, 2017, 2018.
- Lineaire Algebra voor Natuur- en Sterrenkunde (linear algebra), Fall 2011, 2012, 2013.
- Jacobians and Theta Functions (MRI Masterclass Moduli Spaces), Fall 2010.
- Coderingstheorie (coding theory), Spring 2010, 2011.
- Topics in Geometry II (singular homology, sheaves, cohomology), Fall 2009.
- Topics in Geometry I (algebraic geometry), Fall 2006, 2007, 2008.
- Algebra 3 (field extensions, Galois theory), Spring 2006, 2010.
- Complexe Analyse voor LAV-1 (complex analysis), Spring 2006.
- Topologie (topology), Spring 2005.
- Wiskunde 1A voor BFW/LST (calculus), Fall 2005, 2006, 2007, 2008.

Invited talks

- Intercity Seminar Arakelov Geometry, Copenhagen, September 2018.
- Arithmetic geometry seminar, HU Berlin, May 2018.
- Number theory seminar, TU Darmstadt, April 2017.
- Intercity Number Theory Seminar, Universiteit Leiden, March 2017.
- Number theory seminar, Université de Bordeaux, January 2017.
- General colloquium, VU Amsterdam, November 2016.
- Number theory seminar, Copenhagen University, November 2016.
- Conference Arakelov Geometry: archimedean and non-archimedean aspects, Regensburg, September 2016.
- Summer School Current trends in algebraic and arithmetic geometry, Vlieland, The Netherlands, September 2016.
- Workshop on generalizations of $\mathbb{A}^1$-homotopy invariance in algebraic geometry and homotopy theory, Zinnowitz/Usedom, Germany, April 2016.
- 5th Swiss-French workshop on algebraic geometry. Lecture series on the arithmetic Riemann-Roch theorem, Charmey, Switzerland, January 2016.
- Research trimester on multiple zeta values, multiple polylogarithms and quantum field theory, ICMAT, Madrid, October 2014.
- Intercity seminar Arakelov Geometry, Rome, September 2014.

- Number theory seminar, Adam Mickiewicz U, Poznań, May 2014.
- Locally free seminar, Amsterdam, May 2014.
- GAGA seminar, U Utrecht, Utrecht, November 2013.
- Paris-Kyoto-Barcelona seminar, Paris, September 2013.
- BIRS workshop Integrable systems and moduli spaces, Banff, August 2013.
- NoGAGS seminar, Hannover, May 2013.
- Seminar aritmetische Geometrie und Zahlentheorie, U Hamburg, Hamburg, May 2013.
- Séminaire Autour de la Géométrie d'Arakelov, U Paris VI, Paris, May 2013.
- Advances in Teichmüller theory, ESI Vienna, February 2013.
- Heraeus Seminar Algebro-geometric methods in fundamental physics, Physikzentrum Bad Honnef, September 2012.
- Seminar Galois covers and deformations, Bordeaux, June 2012.
- Seminar Graduiertenkolleg Curvature, cycles, cohomology, Regensburg, December 2011.
- Algebro-geometric methods in gauge theory and general relativity, Hanse Institute for Advanced Study, Delmenhorst, September 2011.
- Research program Moduli spaces of Riemann surfaces, Park City, July 2011.
- Conference Heights 2011, Tossa de Mar, April 2011.
- Intercity seminar Algebraic Geometry, Amsterdam, December 2010.
- Intercity seminar Algebraic Geometry, Leiden, September 2010.
- EIDMA Seminar Combinatorial Theory, TU Eindhoven, September 2010.
- DIAMANT symposium, Nunspeet, May 2010.
- Séminaire de Théorie des Nombres, U Paris VI, Paris, March 2010.
- Workshop Arakelov theory and arithmetical applications, Regensburg, February 2010.
- Intercity seminar Number Theory, Groningen, November 2009.
- Algebra and Geometry seminar, U Amsterdam, June 2009.
- Number Theory seminar, Institut Fourier, Université Grenoble I, Grenoble, France, June 2009.
- Number Theory seminar, Max Planck Institut für Mathematik, Bonn, April 2009.
- Arithmétique, géométrie, cryptographie et théorie des codes, CIRM, Luminy, April 2009.
- Journées de géométrie d'Arakelov à Rennes, Rennes, December 2008.
- Intercity Seminar on the Fundamental Lemma, Utrecht, November 2008.
- Conference Moduli spaces, Warwick, July 2008.
- Conference Moduli spaces, Max Planck Institut für Mathematik, Bonn, January 2008.
- Conference Effective aspects of complex hyperbolic varieties, Brest, September 2007.

- Seminar of the Mittag-Leffler Institute, Stockholm, April 2007.
- Arithmetik und Geometrie Seminar, Humboldt U, Berlin, November 2006.
- Lunchcolloquium Faculty of Science, Leiden, November 2006.
- Conference on Modular Forms, Schiermonnikoog, October 2006.
- Workshop Abelian varieties, Amsterdam, May 2006.
- Lunchcolloquium Leidsche Flesch, Leiden, March 2006.
- Intercity Seminar on Khare's work on Serre's conjecture, Nijmegen, November 2005.
- General colloquium, Leiden, October 2005.
- Séminaire Autour de la Géométrie d'Arakelov, U Paris VI, Paris, October 2005.
- Conference Arakelov geometry, Oberwolfach, September 2005.
- Series of lectures at the summer school Number fields and curves over finite fields, Anogia, Crete, July 2005.
- Conference Explicit algebraic number theory, Oberwolfach, July 2005.
- Number Theory seminar, UPC Barcelona, Barcelona, May 2005.
- Intercity seminar Number Theory, Leiden, February 2005.
- Seminario di Teorie dei numeri, Roma Tor Vergata, Rome, January 2005.
- General colloquium, U Amsterdam, December 2004.
- Arithmetik und Geometrie Seminar, Humboldt U, Berlin, June 2004.
- Conference Analogy between number fields and function fields, Texel, April 2004.
- Number Theory Seminar ETH, Zürich, January 2004.
- Intercity seminar on Hodge Theory, RU Nijmegen, March 2002.

Organizational and administrative activities

- Organizer of the workshop Effective methods for Diophantine problems, in honor of the 60th birthday of Jan Hendrik Evertse, Lorentz Center, Leiden (joint with Attila Bérczes, Bas Edixhoven and Kálmán Győry), June 2018.
- PI of the International Graduate School Moduli and Automorphic Forms: Arithmetic and Geometric Aspects, involving U Leiden, U Amsterdam, Humboldt U Berlin, Freie U Berlin, since January 2013.
- PI of the International Erasmus Mundus ALGANT Graduate School and Master Programme, involving U Leiden, U Paris-Sud/Orsay, U Bordeaux, U Padova, U Milano, U Regensburg, U Duisburg-Essen, since January 2006.
- Research manager of the Diamant cluster, since Fall 2010.
- Chair of the Leiden Mathematical Institute's PR committee, recruitment of new students, since September 2010, member since July 2005.
- Member of the Leiden Mathematical Institute's admission committee, since September 2013.

- Member of several PhD reading or opposition committees
- Reviewer for MathSciNet (85 reviews as of November 2017).
- Referee for several journals.
- Editor of the Leiden Mathematical Institute's public webpages, 2005–2014.
- Organizer of the semi-annual Diamant symposium, since Fall 2010.
- Organizer of the research conference Heights and moduli spaces, Lorentz Center, Leiden (joint with G. Freixas i Montplet and G. van der Geer), June 2013.
- Organizer of the Diamant minisymposium at NMC, 2011–2014, 2018.
- Organizer of the research conference Geometry and Arithmetic, in honor of the 60th birthday of Gerard van der Geer, Schiermonnikoog Island (joint with C. Faber and G. Farkas), September 2010.
- Organizer of the Intercity seminar Functorial compactification of moduli of abelian varieties (joint with J. Heinloth), Autumn 2010.