

Gunther Cornelissen • curriculum vitæ • December 25, 2016

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Born July 4th, 1971 — Gent (Belgium)
Nationality Dutch (The Netherlands)
Gender Male

Current position

Professor of mathematics
Chair holder in Geometry and Number Theory
Department Head
Universiteit Utrecht, The Netherlands

Areas of specialization

Number theory | Arithmetic & algebraic geometry
Noncommutative Geometry | Logic | Mathematical physics

Appointments held

2015-2018 Universiteit Utrecht, Head of Department of Mathematics (Mathematical Institute & Science Education Institute)
2014 University of Warwick (UK); visiting professor (1.5 months)
Caltech (USA); visiting professor (1.5 months)
2012- Universiteit Utrecht, full professor; Core Chair “Geometry and Number Theory”
2007-2012 Universiteit Utrecht; full professor; Profile Chair “The interaction between mathematical physics and arithmetic geometry”
2001-2007 Universiteit Utrecht; lecturer; ’03/’05 part-time parental leave
2001 Katholieke Universiteit Leuven (Belgium); part-time visiting professor
1997-2001 Max-Planck-Institut für Mathematik (Bonn, Germany); researcher
1996 Universität des Saarlandes (Saarbrücken, Germany); one month research assistant
1993-2001 FWO (Flemish National Science Foundation, Belgium); pre-/post-doctoral researcher
1993-1997 Universiteit Gent (Belgium); research and teaching assistant

Education

1993-1997 PhD in mathematics, Universiteit Gent
Advisors: Jan Van Geel (Gent) and Ernst-Ulrich Gekeler (Saarbrücken)
1989-1993 Masters (“Licentiaat”) in pure mathematics, Universiteit Gent, summa cum laude
Supervisors: Jan Van Geel (Gent) and Juliusz Brzezinski (Göteborg)
1993 One semester Erasmus exchange student at Chalmers Högskola (Göteborg)
1983-1989 High school diploma at Sint-Lievencollege Gent (main subjects: Latin/mathematics)

Qualifications

- 2016 Administrative academic leadership track, Universiteit Utrecht (Erwin Vermeulen)
- 2016 Workshop “Management of professional expectations”, Wheel of Change (Elmira Nijhuis)
- 2015 Training “Gender awareness”, Direction (Esther Mollema)
- 2008 Senior qualification in research and education, Universiteit Utrecht
- 2002 Basic qualification in education, Universiteit Utrecht
- 1992–1996 Certificate of Swedish language (Hogeschool Gent)
- 1993 High school teachers qualification, Universiteit Gent, magna cum laude

Grants, honours, named lectures & awards

- 2014 Invited research professor, *Trimestre on noncommutative geometry*, Hausdorff Institute (Bonn)
- 2012 Elected member of the *Royal Holland Society of Sciences and Humanities* (KHMW)
- 2012 Twenty-first annual *Charles R. DePrima* memorial lecturer, Caltech
- 2011 Elected *Arbeitstagung* speaker, Bonn
- 2009 Speaker at *Joint New York Number Theory Seminar* (Columbia/CUNY/NYU)
- 2008 NWO personal 5-year senior innovational research grant (VICI) (1,250,000 euro)
From arithmetic geometry to noncommutative Riemannian geometry, and back
- 2007 Invited speaker at the *Clay Mathematical Institute* (Boston)
- 2004 NWO personal 5-year mid-career innovational research grant (VIDI) (600,000 euro)
Non-archimedean geometry and automorphic forms
- 2002;07 Nominated best junior teacher at Universiteit Utrecht by mathematics student union
- 1997– Max-Planck-Gesellschaft one year research scholarship (repeatedly offered)
- 1993–2001 FWO pre- and postdoctoral research scholarship (full salary & benefits)

collaborative grants

- 2015–2019 Principal applicant of NWO Graduate School “Utrecht Geometry Centre” (850,000 euro)
- 2009–2014 ESF network “Interactions between low-dimensional topology and physics” (director J.E. Andersen; approx. 600,000 euro)
- 2007–2008 Two Dutch-French NWO Van Gogh exchange grants with Paris (with Mézard; 9,600 euro)
- 1997–2001 Co-principal investigator on FWO-project Algebraic Geometry (11,500 euro)

smaller grants

- 2015 Marie-Curie scholarship for Martijn Caspers (166,000 euro; proposal written by Caspers)
- 2012 GQT-cluster PhD position grant (170,000 euro)
- 2009 Marie-Curie scholarship for Jonathan Reynolds (120,000 euro; proposal written by Reynolds)
- 2009 Partial funding for PhD position from University Focus Area Grant “Foundations of Natural Sciences” (approx. 100,000 euro)
- 2004– Grants for various workshops from NWO, Research schools, Research clusters, Foundation Compositio, Monna Fund and ESF (approx. 50,000 euro)
- 2002 NWO visitor grant for F. Kato (Kyoto) (1,000 euro)
- 1997 Travel grant from Wuytack Fund (1,500 euro)

Invitations

Recent scientific invitations

- 2016 *XIV Karlsruher Weihnachtsworkshop zur Geometrie und Zahlentheorie*, KIT Karlsruhe
- Mathematical Colloquium, Université de Luxembourg

- Oberseminar Algebra, Universität Ulm
 Workshop *Ergodic Theory & Number Theory*, Göteborg
 Colloquium (E.-U. Gekeler's retirement), Saarbrücken
 Summer School & Conference *Noncommutative Geometry*, Villa de Leyva (5 lectures)
 Conference *Arithmétique en plat pays*, Mons
 Ergodic Theory & Dynamical Systems Seminar, Krakow
 Noncommutative Geometry Seminar, Polish Academy of Sciences, Warsaw
 Conference *Gauge Theory and Noncommutative Geometry*, Nijmegen (no talk)
 Mini-workshop *Operator Spaces and Noncommutative Geometry in Interaction*, Oberwolfach
 2015
 Leibniz Universität Hannover
 International Conference in Number Theory and Physics, Rio de Janeiro
 Colloquium, Utrecht
 Colloquium, Groningen
 2014
 Number Theory Seminar, Max-Planck-Institut, Bonn
 Workshop *Number theory and non-commutative geometry*, Bonn
 Noncommutative Geometry Programme, Hausdorff Institute, Bonn
 Workshop *K-homology and graph C^* -algebras*, ICTP Trieste
 One Day Meeting: *Noncommutative geometry, number theory and dynamics*, Warwick
 Mathematics Colloquium, University of Warwick
 Workshop *Specialization of linear series for algebraic and tropical curves*, Banff
 Colloquium, Florida State University
 Algebra Seminar, UCLA
 Noncommutative geometry seminar, Caltech
 Colloquium, UC San Diego
 Number Theory Seminar, UC San Diego
 Number Theory Seminar, Caltech
 Oberseminar *Algebraische Geometrie*, Universität Hannover
 2013
 Oberseminar *Algebraische Geometrie*, Universität Zürich
 Workshop *Operator algebras and dynamical systems from number theory*, Banff
 Workshop *Noncommutative Geometry*, Oberwolfach (no talk)
 Number Theory and Physics *Oberseminar*, Bonn/Köln
 Number Theory Seminar, Warwick
 Ergodic Theory and Dynamical Systems Seminar, Warwick
Colóquio de Geometria e Aritmética, IMPA, Rio de Janeiro
 C^* -seminar, Oslo
 Colloquium, Saarbrücken
 2012
 Colloquium, Erlangen
 Conference *Rational points on curves*, Oxford
 Conference *Quantum mechanics, Operator Theory and the Riemann Zeta Function*, Benasque
 Conference *Noncommutative Geometry: Multiple Connections*, Ohio State
 Number Theory Seminar, Stanford
 Number Theory Seminar, UCLA
 Colloquium, UCLA
 21st Annual Charles R. DePrima Memorial Lecture, Caltech
 2011
 Groningen, Eindhoven, Utrecht, and VU Amsterdam Colloquium
 Miniworkshop *C^* -algebras and number theory*, Münster
 Workshop *Noncommutative Geometry*, Oberwolfach

Arbeitstagung, Bonn
 Gent Intercity Number Theory Seminar
 London Number Theory Seminar
 Universität Köln Number Theory Seminar
 MPIM Bonn Seminar on Algebra, Geometry and Physics (“Manin seminar”)
 Caltech Noncommutative Geometry Seminar

Some earlier invitations (C=Colloquium; Conf=Conference) at

American Institute for Mathematics Palo Alto (Conf), Barcelona (Conf), Brussels, Caen,
 Clay Institute Boston (Conf), Crete, CUNY, Dagstuhl (Conf), UC Dublin, Essen, ETH
 Zürich, Göteborg, Göttingen (C), Ohio State (Conf), Hiroshima (Conf), Hokkaido, Kas-
 sel, Kinoshita (Conf), Kyoto, Leiden (C), Leuven, Nijmegen (C+Conf), Oberflockenbach
 (Conf), Oberwolfach, Osaka, Oxford, UPenn, Toulouse, Vanderbilt (Conf), Versailles (Conf)

Educational talks & outreach

- 2016 Talk at FysiCie (Utrecht Physics Students society) on *Isospectrality*
- 2013 Internationalisation@Home panel, Universiteit Gent
- Three “Utalent” lectures for high school students
- Junior college module (high school students): *The Riemann hypothesis* (with Andringa)
- Two-day masterclass on *Diophantine equations* for high school students
- 2012 Marie Curie Colloquium (Nijmegen Physics Student Union): *One hundred years of drumming*
- Opening lecture Dutch university mathematical olympiad: *Meeting donuts*
- 2011 National PhD student research afternoon, Utrecht: *The work of Milnor on isospectrality*
- Nationale wiskundedagen, Noordwijkerhout (Math teacher postgraduate event, 700 partici-
pants); session talks:
 - 2017 – *Emmy Noether and symmetry*
 - 2014 – *Euler or Excel: how computers and calculators changed number theory*
 - 2011 – *Klein’s Erlangen programme*
 - 2009 – *“Listening” to shapes*
 - 2004 – *Looking at diophantine equations “from a distance”*
- 2009 Mathematics and Passion, Gent: *Solve, or I will shoot...*; preceded by the play “Evariste” by
theater group NUNC
- 2008 Lustrum lecture for student union “de Leidsche Flesch”
- 2008–2011 Teacher post-graduate education at “ β onder de Dom”; Lorentz Center
- Math student parents’ day Utrecht, various lectures:
 - 2009 – *Things you will never be able to do* (Undecidable problems)
 - 2008 – *Wonders of mathematical cooking* (Banach-Tarski paradox)
 - 2007 – *Listening to shapes* (Isospectrality)
 - 2005 – *How to get from A to B?* (Coarse geometry)
- 2007 Opening lecture Dutch university mathematical olympiad: *Diophantine equations*
- 2008– Visited various high schools with a project on diophantine equations
- 2008– Organized project afternoons on number theory for high school students
- Math summer camp (high school students), Lunteren:
 - 2015 – *Euler, balloons, and all that*
 - 2005 – *Graphs and matrices*
- 2001– Various talks at open days for prospective students: *Can $1 + \dots + m = 1^2 + \dots + n^2$?*

Publications

Research articles in refereed journals & refereed conference proceedings

- 1995 [1] *Sur les zéros des séries d'Eisenstein de poids $q^k - 1$ pour $GL(2, \mathbf{F}_q[T])$* , C. R. Acad. Sci. Paris, 321, Ser. I (1995) 817-820.
- 1997 [2] *Drinfeld modular forms of level T* , in: Drinfeld modules, modular schemes and applications (eds. E.-U. Gekeler et al.), pp. 272-281, World Scientific - Singapore, 1997.
- [3] *Drinfeld modular forms of weight one*, J. Numb. Th. 67, nr. 2 (1997), 215-228.
- 1999 [4] *Stockage diophantien et hypothèse abc généralisée*, C. R. Acad. Sci. Paris, 328, Ser. I (1999), 3-8.
- [5] *Zeros of Eisenstein series, quadratic class numbers and supersingularity for rational function fields*, Math. Ann. 314, nr. 1 (1999), 175-196.
- [6] *Deligne's congruence and supersingular reduction of Drinfeld modules*, Arch. der Math. 72 (1999), 346-353.
- 2000 [7] (with Karim Zahidi) *Topology of diophantine sets: remarks on Mazur's conjectures*, in: Hilbert's Tenth Problem: Relations with arithmetic and algebraic geometry, Contemp. Math. 270 (2000), 253-260.
- 2001 [8] (with Fumiharu Kato and Aristides Kontogeorgis) *Discontinuous groups in positive characteristic and automorphisms of Mumford curves*, Math. Ann. 320, nr. 1 (2001), 55-85.
- [9] *Two-torsion in the Jacobian of hyperelliptic curves over finite fields*, Arch. der Math. 77 (2001), 241-246.
- [10] *The 2-primary class group of certain hyperelliptic curves*, J. Numb. Th. 91, nr. 1 (2001), 174-185.
- 2003 [11] (with Fumiharu Kato) *Equivariant deformation of Mumford curves and of ordinary curves in positive characteristic*, Duke Math. J. 116, nr. 3 (2003), 431-470.
- [12] (with Fumiharu Kato) *Mumford curves with maximal automorphism group II: Lamé type groups in genus 5-8*, Geom. Dedicata 102 (2003), 127-142.
- 2004 [13] (with Fumiharu Kato) *Mumford curves with maximal automorphism group*, Proc. A.M.S. 132 (2004), 1937-1941.
- 2005 [14] (with Fumiharu Kato) *Zur Entartung schwach verzweigter Gruppenoperationen auf Kurven*, J. reine und angew. Math. 589 (2005), 201-236.
- [15] (with Karim Zahidi and Thanases Pheidas) *Division-ample sets and the Diophantine problem for rings of integers*, J. Théorie des Nombres de Bordeaux 17 (2005), 727-735.
- [16] *Lifting an automorphism to finite characteristic*, Rend. Sem. Mat. Univ. Padova 113 (2005), 137-139.
- 2006 [17] (with Ariane Mézard) *Relèvements des revêtements de courbes faiblement ramifiés*, Math. Z. 254 (2006), 239-255.
- 2007 [18] (with Karim Zahidi) *Elliptic divisibility sequences and undecidable problems about rational points*, J. reine und angew. Math. 613 (2007), 1-33.
- [19] (with Matilde Marcolli, Kamran Reihani and Alina Vdovina) *Noncommutative geometry*

on trees and buildings, in: *Traces in Geometry, Number Theory and Quantum Fields* (eds. S. Albeverio et. al.), *Aspects of Math. E* 38, pp. 73-98, Vieweg Verlag (2007).

- 2008 [20] (with Oliver Lorscheid and Matilde Marcolli) *On the K -theory of graph C^* -algebras*, *Acta Appl. Math.* 102 (2008), no. 1, 57-69.
- [21] (with Alexandra Shlapentokh) *Defining the integers in large subrings of number fields using one universal quantifier*, *Proc. St.-Petersburg Math. Sem.* 358 (2008), 199-223 (special volume: 60th birthday volume for Yuri Matijasevich "Studies in Constructive Mathematics and Mathematical Logic, Part XI", ed. Maxim Vserminov) and *J. Math. Sci.* 158 (2009), no. 5, 713-726.
- [22] (with Matilde Marcolli) *Zeta functions that bear the shape of a Riemann surface*, *J. Geom. Phys.* 58 (2008), no. 5, 619-632.
- 2009 [23] (with Oliver Lorscheid) *Toroidal automorphic forms for certain function fields*, *J. Numb. Th.* 129 (2009), 1456-1463.
- [24] (with Jakub Byzewski) *Which weakly ramified group actions admit a universal formal deformation?*, *Ann. Inst. Fourier* 59 (2009), no. 3, 877-902.
- 2010 [25] (with Aristides Kontogeorgis and Lotte van der Zalm) *Arithmetic equivalence, the Goss zeta function, and a generalisation*, *J. Numb. Th.* 130 (2010), no. 4, 1000-1012.
- [26] (with Nikolas Akerblom) *A compact codimension two braneworld with precisely one brane*, *Phys. Rev. D* 81 (2010), 124025 (6pp.).
- [27] (with Fumiharu Kato and Aristides Kontogeorgis) *Three examples of the relation between rigid-analytic and algebraic deformation parameters*, *Israel J. Math.* 180 (2010), 345-370.
- 2011 [28] (with Nikolas Akerblom, Gerben Stavenga and Jan-Willem van Holten) *Nonrelativistic Chern-Simons vortices on the torus*, *J. Math. Phys.* 52 (2011), 072901 (17 pp.).
- [29] (with Nikolas Akerblom) *Relative entropy as a measure of inhomogeneity in general relativity*, *J. Math. Phys.* 53 (2012), 012502 (10 pp.).
- 2012 [30] (with Jakub Byszewski and Fumiharu Kato) *Un anneau de déformation universel en conducteur supérieur*, *Proc. Japan Acad. Sci., Ser. A, Math. Sci.* 88 (2012), nr. 2, 25-27.
- [31] (with Oliver Lorscheid) *Toroidal automorphic forms, Waldspurger periods and double Dirichlet series*, in: *Multiple Dirichlet Series, L-functions and Automorphic Forms*, *Progress in Math.* 300, Birkhäuser (2012).
- [32] (with Jan Willem de Jong) *The spectral length of a map between Riemannian manifolds*, *J. Noncommut. Geom.* 6 (2012), 721-748.
- [33] (with Jonathan Reynolds) *Matrix divisibility sequences*, *Acta Arith.* 156 (2012), 177-188.
- 2013 [34] (with Janne Kool) *Measure theoretic rigidity for Mumford curves*, *Ergodic Th. Dyn. Syst.* 33, nr. 3 (2013), 851-869.
- [35] (with Matilde Marcolli) *Graph reconstruction and quantum statistical mechanics*, *J. Geom. Phys.* 72 (2013), 110-117.
- [36] *Curves, dynamical systems, and weighted point counting*, *Proc. Natl. Acad. Sci. USA* 110, no. 24 (2013), 9669-9673.
- 2014 [37] (with Matilde Marcolli) *Quantum statistical mechanics, L-series and anabelian geometry I:*

Partition Functions, in: Trends in Contemporary Mathematics, INdAM Series, Vol. 8 (2014), 47–57, Springer Verlag.

2015 [38] (with Fumiharu Kato and Janne Kool) *A combinatorial Li-Yau inequality and rational points on curves*, Math. Ann. 361, no. 1 (2015), 211–258.

2016 [39] (with Jonathan Reynolds) *The perfect power problem for elliptic curves over function fields*, New York J. Math. 22, 95–114 (2016).

[40] (with Aristides Kontogeorgis) *Distances in spaces of physical models: partition functions versus spectra*, Lett. Math. Phys. (2016), doi:10.1007/s11005-016-0891-1.

Unpublished/Preprints

2016 [Pre3] (with Janne Kool) *Rigidity and reconstruction for graphs*, preprint (2016).

2015 [Pre2] (with Janne Kool) *Edge reconstruction of the Ihara zeta function*, preprint (2015).

[Pre1] (with Valentijn Karemaker) *Hecke algebra isomorphism and adelic points on algebraic groups*, preprint (2014).

2010 [U2] (with Matilde Marcolli) *Quantum statistical mechanics, L-series and anabelian geometry*, preprint arxiv:1009.0736 (2010), 46 pp., not for publication.

2002 [U1] (with Marina Tripolitaki) *Torsion of Drinfeld modules and equicharacteristic unimodular Galois covers*, preprint arxiv:math.NT/0209023 (2002), unpublished, should be revised.

Research expository writing

1993 [M] *Endomorphisms of elliptic curves*, Master's thesis (Universiteit Gent), 100 pp.

1997 [T] *Geometric properties of modular forms over rational function fields*, PhD thesis (Universiteit Gent), 141 pp.

1997 [E1] *A survey of Drinfeld modular forms*, in: Drinfeld modules, modular schemes and applications (eds. E.-U. Gekeler et al.), pp. 167–187, World Scientific - Singapore, 1997.

2000 [E2] *Nichtarchimedische Geometrie*, in: Max-Planck-Gesellschaft: Jahrbuch 2000, pp. 566–571, Verlag Vandenhoeck & Ruprecht, Goettingen, 2000.

[E3] *Diangle groups*, in: Proceedings 2000 Kinosaki Symposium on algebraic geometry, pp. 138–143, 2001.

2005 [E4] (with Fumiharu Kato) *The p-adic icosahedron*, Notices A.M.S. 52, no. 7 (August, 2005), 720–727.

2011 [E5] *Class field theory as dynamical system*, in: Arbeitstagung 2011 (Don Zagier 60th birthday conference), Publication of the Max-Planck-Institut für Mathematik, Bonn, pp. 83–85 (arxiv:1107.2159).

[E6] *Reconstructing global fields using noncommutative geometry*, Oberwolfach Report 45 (2011), 27–30.

2016 [E7] *Reconstruction problems in number theory in the light of C^* -algebras*, Oberwolfach Report 2016/6, 2016, 20–22.

Popular articles, long book reviews & opinion pieces (mostly in Dutch)

- 2002 [P₁] *Aritmetische meetkunde*, [What is arithmetical geometry?] Vakidoot (Studievereniging A-Eskwadraat), Jaargang '02-'03, nr. 1 (Themanummer "Oriëntatie"), 5–7.
- 2004 [P₂] *Parti d'un exercice, on se retrouve avec une théorie – over Jean-Pierre Serre*, [About Jean-Pierre Serre] Nieuw Arch. Wiskd. (5) 5 (2004), no. 1, 35–37.
- 2005 [P₃] *Diophantische vergelijkingen vanuit de verte bekeken*, [Looking at Diophantine equations from a distance] Nieuwe Wiskrant 24, no. 4 (June 2005), 23–30.
- [P₄] (illustrated by cartoonist Peter van Straaten) *Klaas Landsman: Requiem voor Newton — Turks Fruit der Natuurkunde*, [Long Book review] Nieuw Arch. Wiskd. (5) 6 (2005), no. 4, 317–319.
- 2006 [P₅] *Diophantische vergelijkingen – Kunnen we het echt?* [Diophantine equations: can we really solve them?] Nieuw Arch. Wiskd. (5) 7 (2006), no. 1, 37–41.
- [P₆] *Meetkunde, meetkundes, en groepen*, [Geometry, geometries and groups, on Klein's Erlangen Programme], Vakidoot (Studievereniging A-Eskwadraat), Jaargang '05-'06, nr. 4 (Themanummer "Parallel"), 4–9.
- 2008 [P₇] *België-Nederland 1-0: Sole meunière*, [Column] Nieuw Arch. Wiskd. (5) 9 (2008), no. 1, 65.
- [P₈] *België-Nederland 2-0: De laatste der Bourbakisten*, [Column] Nieuw Arch. Wiskd. (5) 9 (2008), no. 3, 207.
- [P₉] *Math Girls Rule, A Dutch success story*, Nieuw Arch. Wiskd. (5) 9 (2008), no. 2, 108.
- [P₁₀] *Duitsland-Nederland 1-0: The Architect Sketch, part 2*, [Column] Nieuw Arch. Wiskd. (5) 9 (2008), no. 4, 273.
- [P₁₁] *Diophantische vergelijkingen: mogelijkheden en onmogelijkheden*, [Diophantine equations: possibilities and impossibilities, a text for high school students], wiskunde-D keuzemodule, Epsilon Uitgaven (online, 2008), 51pp.
- [P₁₂] (with Steven Wepster) *Docentenhandleiding bij (P₁₀)*, [Teacher's guidebook accompanying (P₁₀)], 28pp. (2008).
- 2009 [P₁₃] *The Princeton Companion — Waardig gezelschap aan de koffietafel*, [Long book review] Nieuw Arch. Wiskd. (5) 10 (2009) 40–41.
- [P₁₄] *Het meten van dubbelzinnigheid* ["Measuring ambiguity"; Inaugural lecture], Universiteit Utrecht (2009), abbreviated version in: Nieuw Arch. Wiskd. (5) 10 (2009), no. 2, 84–90.
- [P₁₅] *Wiskundig onderzoek per computer?* (ed.) [Mathematical research by computer?], Nieuw Arch. Wiskd. (5) 10 (2009), 197–201.
- 2010 [P₁₆] *Yuri Manin: Mathematics as Metaphor — Ik loop blootsvoets over worstenbroodjes* [Long book review] Nieuw Arch. Wiskd. (5) 11 (2010), 117–118.
- [P₁₇] (with Klaas Landsman and Walter van Suijlekom) *The flashes of insight never came for free — Interview with Alain Connes*. Nieuw Arch. Wiskd. (5) 11 (2010), 250–256.
- 2012 [P₁₈] *Alexander Masters: Simon, The Genius in my Basement — Het gapend genie* [Long book review] Nieuw Arch. Wiskd. (5) 4, 276–277 (2012).

- 2013 [P19] *DVD Review of “Late Style – Yuri I. Manin looking back on a life in mathematics”*, Notices A.M.S. 60, no. 1, 84–85 (2013).
- 2014 [P20] *Differentiaalmeetkunde in de getaltheorie* [Differential Geometry in Number Theory], Nieuw Arch. Wiskd. (5) 15, 188–191 (2014).
- 2014 [P21] *Het lustrum van WONDER* [Five years of WONDER], Nieuw Arch. Wiskd. (5) 16, 106–107 (2015).

Short book reviews in Nieuw Arch. Wiskd.

- 1997 [B1] Yu. Manin and S. Gelfand, *Methods of homological algebra*, Mededelingen Wiskundig Genootschap, review 97.03-18-839 (1997).
- 2000 [B2] H. Cartan and S. Eilenberg, *Homological algebra* (reprint), Nieuw Arch. Wiskd. (5) 1, nr. 3 (2000).
- 2001 [B3] D. Haskell, A. Pillay and C. Steinhorn (eds.), *Model theory, algebra and geometry*, Nieuw Arch. Wiskd. (5) 2, nr. 4 (2001).
- 2004 [B4] A. Stubhaug, *Ein aufleuchtender Blitz: Niels Henrik Abel und seine Zeit*, Nieuw Arch. Wiskd. (5) 5, nr. 2 (2004).
- 2011 [B5] A. Terras, *Zeta Functions of Graphs: A Stroll through the Garden*, Nieuw Arch. Wiskd. (5) 12, nr. 3 (2011).
- 2015 [B6] Leila Schneps (ed.), *Alexandre Grothendieck, A Mathematical Portrait*, Nieuw Arch. Wiskd. (5) 16, nr. 1 (2015).

Editorial work

- 2005 [ED1] (edited with Frans Oort) *Problems from the workshop on “Automorphisms of Curves”* (Leiden, August, 2004), Rend. Sem. Mat. Univ. Padova 113 (2005), 129–177.
- 2008 [ED2] (edited with Gerard Albers, Patrick Oonincx and Martin Raussen) *Amsterdam Archive*, special issue of Nieuw Arch. Wiskd. (5) 9, nr. 2 (June 2008), issued on the occasion of the fifth European Congress of Mathematics, Amsterdam, July 13–18, 2008.
- 2013 [ED3] (edited with Gianni Landi) Special issue *Noncommutative Algebraic Geometry and its Applications to Physics* (Leiden, March, 2012), Journal of Geometry and Physics.

Supervision & teaching

Postdoc supervision

- 2016–2017 Ana Ros Camacho (from Jussieu)
- 2015–2018 Martijn Caspers (from Münster; two years on Marie-Curie scholarship)
- 2009–2011 Bram Mesland (from MPIM; to post-doc at Manchester)
- Jorge Plazas (from IHES; to post-doc at Granada)
- Jonathan Reynolds (from UEA on Marie-Curie scholarship; to UK teacher training)
- 2011 Lode Wylleman (from Gent; to post-doc at Stavanger)

PhD thesis supervision

- 2008 Oliver Lorscheid, *Toroidal automorphic forms for function fields*
- 2009 Jakub Byszewski, *Aspects of equivariant deformation theory* (co-supervisor Ariane Mézard)
- 2011 Jan Willem de Jong, *Zeta function rigidity — a view from non-commutative geometry*

- 2012 Jan Jitse Venselaar, *Classification & equivalences of noncommutative tori & quantum lens spaces*
 2013 Janne Kool, *Curves, graphs and dynamics*
 2014 Sebastian Klein, *Chow groups and intersection products for tensor triangulated categories* (co-supervisor Paul Balmer)
 2016 Valentijn Karemaker, *Hecke algebras, Galois representations and abelian varieties*
 2020 (exp.) Harry Smit, *Reconstruction problems for arithmetic schemes*

Master thesis supervision

- 2004 Syb Botma, *Tro-p-adical geometry* (co-supervisor: Stienstra)
 2005 Sander Bessels, *One step beyond the solvable equation*
 2006 Marco Streng, *Elliptic divisibility sequences with complex multiplication*
 published in Algebra & Number Theory, 2 (2008), No. 2, 183-208
 Ruden Teuben, *The theorem of Riemann–Roch for number fields*
 2007 Maarten van Pruijssen, *Tautological cycles on Jacobians* (main supervisor: van der Geer)
 2008 Esther Bod, *Hilbert’s tenth problem*
 Lotte van der Zalm, *Arithmetic equivalence*
 published in J. Numb. Th. 130, (2010), 1000-1012
 2009 Rutger de Looij, *Primes in elliptic divisibility sequences*
 Sebastian Klein, *Reconstructive geometry in certain triangulated categories*
 Prize for best master thesis from national research cluster in geometry and quantum theory, 2009
 2011 Jori Matthijssen, *Common divisors of elliptic divisibility sequences over function fields*
 Peter Toth, *Geometric abelian class field theory* (main supervisor: Heinloth)
 2012 Renée Hoekzema, *Generalized causal dynamical triangulations in 2d* (main supervisor: Loll)
 2014 Florian Kluck, *A metric in the space of spectral triples*
 Koen van Woerden, *Variation of the number of points on elliptic curves*
 Peter Lombaers, *Dessins d’enfants for surfaces*
 2015 Jeroen Hanselman, *Semi-stable reduction and models of curves*
 2016 Harry Smit, *Dynamical systems and L-series*
 Daniel Kroes, *Edge reconstruction of graphs*
 2017 (exp.) Tom van Overbeeke, *Random matrices and function fields*
 Lois van der Meijden, *Iteration of rational functions in positive characteristic*
 Maxim Faber, *Elliptic functions in condensed matter physics* (with Rembert Duine, ITF)

Bachelor thesis supervision

- 2002 Ryk Westwood, *Dirichlet theorem for polynomials over finite fields*
 2003 Wouter Waalewijn, *Rank of elliptic curves under field extensions*
 Marius de Leeuw, *Integer points on elliptic curves*
 Martijn Kool, *The local-global principle for conics and elliptic curves*
 Ruden Teuben, *Fermat’s last theorem for regular primes*
 2004 Willem Maat, *Collatz Problems*
 Jan-Willem de Jong, *Cyclotomic field extensions of \mathbf{Q} and $\mathbf{F}_q(T)$*
 Marco Streng, *Analytic proofs of quadratic and quartic reciprocity*
 2005 Sander Bessels, *Primes of the form $x^2 + ny^2$*
 2006 Joris Borgdorff, *Expanding graphs*
 2008 Wouter van der Bilt, *Elliptic curves and class numbers*
 2009 Johan Konter, *K-theory of graphs and buildings*
 published in: J. Konter and A. Vdovina, Classifying polygonal algebras by their K_0 -group,

Proc. Edinburgh Math. Soc. (2) 58 no. 2 (2015), 485–497

Daniele Giovannini, *Elementary proofs of Dirichlet's theorem for polynomials*

Rianne Maes, *Cryptography with elliptic curves*

2010 Maria Velema, *Graph puzzles and exceptional geometries*

Thom Klaasse, *Distances between metric spaces*

2012 Ederick Ruiz, *Finite p -groups are nilpotent*

2013 Willem Pranger, *Riemann's explicit formula for the prime counting function*

2014 Merlijn Staps, *Som- en verschilverzamelingen*

published in: The relative sizes of sumsets and difference sets, *Integers* 15 #A42 (2015), 6pp.

2014 Franziska Gerken, *The Ihara zeta function of a graph*

2015 Jan-Willem van Ittersum, *Mahler's Measure and Möbius Transformations*

published in: A group invariant version of Lehmer's conjecture on heights,

J. Numb. Th. 171 (2017), 145–154

Thijs van der Gugten, *De laatste stelling van Fermat voor reguliere priemgetallen*

Alexander Gietelink, *The Noncommutative boundary of the moduli space of elliptic curves*

Jetze Zoethout, *The edge adjacency matrix of a graph*

Lars van de Berg, *De Riemann-hypothese voor elliptische krommen over een eindig lichaam*

2016 Ragnar Groot Koerkamp, *Computational aspects of gonality of graphs*

Joost Franssen, *The casus irreducibilis*

Mees Verheije, *De zeldzaamheid van polynomen met niet-maximale Galoisgroep*

Joost Houben, *Undecidability of the spectral gap*

Other supervision

2002– Supervision of various small first year research projects (constructibility by ruler and compass, transcendental numbers, ...)

2006 Jannis Visser, *Computations in the K -theory of C^* -algebras of graphs with small Betti number* [University College Science Lab SCI 291 thesis]

2007 Valentijn Karemaker, Brigitte Sprenger, Bruno van Albada, *Understanding sliding puzzles, Rubik's Cube, and other permutation puzzles* [Junior College Thesis (high school students)]

van Melsen Prize for best science highschool thesis

€ prize winner at European Young Investigators Conference (St.-Petersburg)

Puspita Sari, *Graph puzzles* [Master's Thesis in Mathematics Education (half of the thesis concerning mathematics research)]

2009 Saskia Chambille, Tessa Matser, Marisse Westbroek, *Gödel's theorem under a variable logic* [Junior College thesis (high school students)]

Alvaro Veliz Osorio, *Holographic dendrology* [Master class "Calabi-Yau Geometries" essay]

2010 Ori Yudilevich, *Zeta functions on Riemannian manifolds and noncommutative spaces* [Master class "Arithmetic geometry and noncommutative geometry" essay]

Javier Saenz, *On the group completion of the fundamental group of a compact Riemann surface* [Master class "Arithmetic geometry and noncommutative geometry" essay]

2015 Bobby Subroto, *Group cohomology* [honours project]

Teaching (at Utrecht, unless stated otherwise)

1993 *Calculus* (High school teaching Lyceum; St.-Lievencollege Gent, 4 weeks)

1993–1997 T.A. for *Algebra* (Gent, 2nd year) T.A. for *Computer algebra* (Gent, 3rd year)

2001 *Riemann surfaces* (Leuven, masters)

Mathematics for Chemists: vector calculus (bachelor level; evening classes)

- 2001 *Algebraic number theory* (3rd year)
Algebra A (Rings) (2nd year)
Algebra B (Groups) (2nd year)
Algebra C (Galois theory) (2nd year)
- 2002;03;08 *Caleidoscope of mathematics* (1st year); lecture on “Rational points on conics”
- 2002 *Rings* (2nd year)
Groups and Galois theory (2nd year)
Elliptic curves (3rd year) (2nd year)
- 2003 *Group theory* (2nd year)
Galois theory (2nd year)
Seminar on p -adic numbers (3rd year, following a book by Cassels)
- 2004 *Rings and Galois theory* (2nd year)
The Mordell-Weil theorem for abelian varieties (Spring School Abelian Varieties; 7h)
- 2005 *Group theory* (2nd year)
- 2006 *Rings and Galois theory* (2nd year)
- 2007 *Arithmetic of elliptic curves* (Summer School; 6h)
- 2008 *Elliptic curves* (national masters)
Topics in mathematical research: K -theory of graphs (Gent, guest lecture; 4h)
- 2008;09 *Diophantine equations: possibilities and impossibilities* (Junior College Utrecht; highschool Mathematics level D)
- 2009 *Moduli of elliptic curves* (masters)
- 2010 *Seminar on Fuchsian groups* (masters, following a book by Katok)
Seminar on spectral triples (masters, following original papers)
- 2011 *Seminar on metric spaces* (bachelor, following a book by Burago-Burago-Ivanov)
What is mathematics? (bachelor, 1st year)
- 2012 *2 1st century notions of “space” in mathematics* (Descartes College; university-wide honours)
What is mathematics? (bachelor, 1st year)
Seminar on quadratic forms and L -series (bachelor, following a book by Serre)
- 2013 *Seminar on Galois groups and fundamental groups* (masters, following a book by Szamuely)
Group Theory (bachelor, 2nd year)
Seminar on Fourier analysis on number fields (masters, following a book by Ramakrishnan and Valenza)
Honours bachelor seminar on graph theory (bachelor; with F. Beukers and T. Müller)
- 2014 *Group Theory* (bachelor, 2nd year)
- 2015 *Seminar on Arithmetic on Curves* (masters, following papers; with C. Faber)
Orientation on research in geometry (coordinator)
- 2016 *Seminar Number Theory Advanced Topics in Elliptic Curves* (masters; with F. Beukers and V. Karemaker)
 p -adic numbers (6h, bachelors; Summer School)
Orientation on research in mathematics (coordinator)
Seminar Local-global principles for diophantine equations (masters; with D. Schindler)

Service to the profession

Editorships

- 2012 Guest editor *Journal of Geometry and Physics*
- 2008-2013 *Nieuw Archief voor Wiskunde* (Dutch Mathematical Society magazine)

2006–2009 Zebra (book series for high school students)
2005 Guest editor *Rend. Sem. Mat. Univ. Padova*

Memberships of professional & learned societies

2012– Koninklijke Hollandsche Maatschappij der Wetenschappen (Royal Holland Society of Sciences and Humanities; elected member)
2005– Koninklijk Wiskundig Genootschap (Dutch Mathematical Society)
2005– American Mathematical Society (Life long member)
2006– GQT research cluster (Geometry and Quantum Theory)
2006– DIAMANT research cluster (Discrete, Interactive and Applied Mathematics, Algebra and Number Theory)

Conference & Seminar Organisation

2016 Mini-symposium *Hecke meets Galois* (Utrecht)
2015 *Aachen–Köln–Lille–Siegen–etc. seminar day on modular forms* (Utrecht); with Zwegers
2014 WONDER–afternoon on the work of Sinai (Eindhoven); with Koren
Berkovich Skeletons: a minicourse by Nicaise and Payne (Utrecht); with Draisma
Intercity seminar day on *Number Theory and Algebraic Groups* (Utrecht)
Mini-symposium on *Triangulated categories & algebraic geometry* (Utrecht)
2013–2014 *Geometry and Quantum Theory Graduate School & Colloquium* (Woudschoten); with Cavalcanti, Posthuma and Solleveld
2013– Seminar *Geometry and Algebra* (Utrecht); with Faber
2013 WONDER–afternoon on the work of Deligne (Delft); with van Neerven
Special functions and special numbers (Utrecht); with Dahmen
Mini-symposium on *combinatorics & arithmetic geometry* (Utrecht)
Intercity seminar day on *Gonality* (Utrecht)
2012 WONDER–afternoon on the work of Szemerédi (Amsterdam); with Eisner
Mini-symposium on *Noncommutative spaces* (Utrecht)
Noncommutative algebraic geometry and physics (Leiden); with Bruzzo, Landi, Roubtsov
2011 Intercity seminar day on *Number theory and measure theory* (Utrecht)
WONDER–afternoon on the work of Milnor (Utrecht)
2010 Intercity seminar day on *Number theory and physics* (Utrecht)
2009 *The analytic theory of automorphic forms* (Utrecht); with Beukers
Seminar day Δ and Δ : *number theory and global analysis* (Utrecht)
Aachen–Köln–Lille–Siegen–etc. seminar day on modular forms (Utrecht); with Bruinier
2008 *Applications of noncommutative geometry* at ECM (Amsterdam); with Landsman
GQT meets DIAMANT (cluster meeting) (Leiden); with Draisma
Genus two day, Utrecht
12th Workshop on Elliptic Curve Cryptography (ECC), Utrecht; with Bernstein et. al.
2005 *Arithmetic geometry and high energy physics* (Leiden); with Marcolli, Waldron
2004 *Automorphisms of curves* (Leiden); with Oort
2003–2006 Weekly colloquium Utrecht; with Crainic, van de Leur
2002 Mini-workshop *Hilbert’s tenth problem, Mazur’s conjecture and divisibility sequences* (Oberwolfach); with Matijasevich, Shlapentokh, Vsemirnov, Zahidi
Intercity Learning Seminar *Automorphic forms that admit an infinite series expansion*; with Dijkgraaf, Heckman, Looijenga
2001– Various Dutch Intercity Seminars on Number Theory at Utrecht

- 2001 Day on 200 years of number theory after Gauss (Gent), with Van Geel
 2000 *Arithmetic geometry*, meeting BMS/DMV meeting (Liège); with Huber, Künemann, Veys
 1998–2001 weekly Oberseminar MPIM (Bonn)
 1998–2001 weekly number theory lunch seminar MPIM (Bonn)
 1999 *Hilbert’s 10th problem: relations with arithmetic & algebraic geometry* (Gent); with Denef et. al.
 1996 *Drinfeld modules, moduli schemes and applications* (Alden-Biezen); with Van Geel.

Reviewing & Refereeing

- 1999– Reviewer for *Zentralblatt der Mathematik* (approx. 3 reviews per year)
 1999– Referee/panelist at ANR, DFG, EPSRC, ERC, ESF, ISF, FWO, NSERC, NSA, NSF, NWO
 2005–2006 Selection committee for NWO personal early career grants (VENI)
 2009–2011 Selection committee for NWO MEERVOUD programme (“more women in exact sciences”)
 2012 Selection committee for NWO-EW Free Competition grants
 2013 Selection committee for NWO-EW TOP-2 Grants (Chair)
 1999– Referee for journals (multiple hits; approx. 5 requests per year): *Acta Arith.*, *Adv. Math.*, *Am. J. Math.*, *Ann. E.N.S.*, *Ann. Inst. Fourier*, *Archiv Math*, *Comm. Numb. Th. Phys.*, *Compos. Math.*, *C.R.A.S.*, *Duke Math. J.*, *Illinois J. Math.*, *Indagationes Math.*, *Integers*, *I.M.R.N.*, *Int. J. Numb. Th.*, *J. Algebra*, *J. A.M.S.*, *J. Geom. Phys.*, *J. London Math. Soc.*, *J. Noncommut. Geom.*, *J. Numb. Th.*, *J. Pure Appl. Alg.*, *Lett. Math. Phys.*, *Proc. A.M.S.*, *Proc. Edinburgh Math. Soc.*, *Math. Ann.*, *Math. Proc. Camb. Phil. Soc.*, *Ramanujan J.*, *Quarterly J. of Math.*, etc.
 1999– Referee for various proceedings volumes

PhD thesis evaluation committees

- R=reading committee, E=exam committee; at Utrecht Mathematics unless indicated
 — In the period 2015–2018, I chair (most) PhD defenses, so I cannot be on the committees

- 1999 Karim Zahidi (R, Gent)
 2001 Francis Gardeyn (R, ETHZ/Gent)
 2008 Rogier Swierstra (R), Cécile Poirier (R, RuG/Toulouse); Sander Dahmen (R), Giorgio Trentinaglia (R), Alex Boer (E), Camilo Arias Abad (E)
 2009 Charlene Kalle (E), Vincent van der Noort (E)
 2010 Marco Streng (R, Leiden), Andor Lukacs (E), Jeroen Sijlsing (R), Marius de Leeuw (R, UU Physics), Pjotr Negadailov (E)
 2011 Dave Carchedi (R), Maarten van de Meent (R, UU Physics), Job Kuit (E), Vadim Gorin (E), Bora Yalkinoglu (E, Paris 8)
 2012 Bart van den Dries (E), Timothy Budd (R, UU Physics)
 2013 Simen Rustad (R, Oslo), Ionut Marcut (E), Bas Fagginger-Auer (E)
 2015 Athanasios Angelakis (R, Leiden), Roberta Iseppi (R, Nijmegen); Enrico Varela (R, Saarbrücken)

Other service to the profession

- 2007;09;12;13 Problem author at the Dutch University Mathematics Olympiad (LIMO)
 2008 Initiated project on polyhedra at two elementary schools in Utrecht
 2008 Initiated project Dutch subtitles for documentary about Julia Robinson; for high school use
 2009–2013 Board of Mathematical Cluster GQT “Geometry and Quantum Theory”
 2010 Co-author of research self-assessment of GQT

- 2009-2011 Director Research school “Mathematical Research Institute” (MRI)
- 2009-2014 Board and steering committee ESF-network “Interaction of low-dimensional Topology and Physics” (ITGP)
- 2011-2014 (Founding) director Dutch Research Graduate School for Mathematics (WONDER)
- 2011 Examiner (mathematics) for Unitas’ “375 years Utrecht University: Knowledge Game”
- 2012 Search committee professor of non-commutative geometry at Antwerp
- 2012 Search committee professor of algebra and number theory at Antwerp
- 2012 Search committee associate professor at QGM/Aarhus
- 2012 Committee Update of Dutch Masterplan for Mathematics (NWO)
- 2012 Committee on “learning outcomes” for Flemish mathematics Bachelors/Masters (VLIR)
- 2012- Program committee “Nationale Wiskunde Dagen” (Math Teacher’s Event)
- 2012- Vice-chair of the National committee on Mathematical Research (Platform Mathematics)
- 2013- Selection committee ASML Young Talent Prize for mathematics students
- 2015 Search committee professor of algebraic geometry at ULB Brussels
- 2016 ESF Lead reviewer for the mathematical research unit, University of Luxemburg
- 2016 Selection committee for the 2017 Brouwer Medal (tri-annual prize of the KWG)

Service to the university

- 2002 Curriculum committee for the Bachelor “Mathematics and Applications”
- 2007-2009 Departmental advisory board
- 2008 Teaching qualification committee
- 2007 Chairman advisory committee on the future of the mathematical institute
- 2009 Chairman committee on efficient teaching (curriculum review)
- 2009 Search committee for a chair “ICT use in mathematics education”
- 2009 Co-author and coordinator of the departmental research self-assessment 2003-2008
- 2010-2013 Advisory committee for grant applications in natural sciences (2012- Chair)
- 2011 Interdisciplinary “Task force mathematical institute”
- 2011 Nominator for Tom Ward (UEA) as *F.C. Donders* visiting professor
- 2011- Ambassador of natural sciences at Utrecht (faculty reorganization subcommittee)
- 2011 Co-author departmental strategic plan
- 2011 Committee on tenure/hiring criteria
- 2011- Chair of the Monna Trust committee
- 2012 Search committee for two full professors
- 2012 Chair of search committee for one assistant professor
- 2012 Committee on midterm research evaluation
- 2013 Chair of search committee for one assistant professor
- 2013 Chair of assessment committee for a profile chair in Scientific Computing
- 2013 Faculty project team Gender
- 2014 Member of search committee for an endowed chair on Public understanding of science
- 2015-2018 Chair of the department of mathematics (mathematical & science education institute)
- 2015 Member of review committee of bachelor curriculum mathematics, with special attention for algebra and modelling
- 2016 Scientific scan committee of professors in CS department
- 2016 Hiring committee for Head of Support, Science Faculty
- 2016 Member of review committee of bachelor curriculum mathematics, with special attention for analysis

Major projects initiated or (co-)executed as department chair

Refurbishment of Library/Discussion rooms for masters students and staff

6-yearly research evaluation (outcome: “excellent” in research, relevance and viability)

Introduction of an independent management structure for the science education institute

Introduction of informal lunch meetings & new quarterly colloquium

Negotiations for university professor appointment in mathematics

Gender policy; increase in percentage of female research staff from 7% to 15%

PhD student scan and development of a workshop on PhD supervision (with Elmira Nijhuis and Jason Frank)