# Curriculum Vitae

## Raf Bocklandt

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### Personal Details

First Names: Rafaël Robert Julia
Surname: Bocklandt
Gender: Male
Date of birth: 6th of October, 1977
Place of birth: Hamme, Belgium
Citizenship: Belgian

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### Language Knowledge

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| **Dutch** | native |
| **English** | good |
| **French** | good |
| **Italian** | fair |
| **Portuguese** | basic |

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### Education

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| 10/1995–07/1999 | Licentiaat Zuivere Wiskunde ($\cong$ Master in Pure Mathematics) at Ghent University <br> Thesis: *Knot invariants and the Jones Polynomial* <br> Supervisor: Prof. Dr. W. Mielants |
| 10/1996–07/2000 | Licentiaat Theoretische Natuurkunde ($\cong$ Master in Theoretical Physics) at Ghent University <br> Thesis: *Noncommutative geometry and the Standard Model* <br> Supervisor: Prof. Dr. H. Verschelde |
| 10/2000–07/2001 | Aggregaat Natuurkunde ($\cong$ Master in Teaching Physics) at Ghent University |
| 10/2001–07/2002 | Advanced Master in Linguistics at Ghent University <br> Thesis: *Dialect Loss among the youth in Hamme* <br> Supervisor: Prof. Dr. J. Taeldeman |
| 10/1999–04/2002 | Phd in Mathematics at the University of Antwerp <br> Thesis: *The Geometry of Quotient Varieties of Quivers* <br> Supervisor: Prof. Dr. L. Le Bruyn. |

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| 02/2013–01/2014 | University teaching qualificaton (BKO) at the University of Amsterdam |

## Working Experience

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| 10/1999–08/2002 | Full time teaching assistant algebra and geometry at the University of Antwerp |
| 09/2002–09/2003 | Part time teaching assistant algebra and geometry at the University of Antwerp |
| 09/2002–10/2002 | Post-doctoral research fellow for the TMR at the University of Bielefeld |
| 11/2002–07/2003 | Post-doctoral research fellow at the University La Sapienza in Rome |
| 10/2003–12/2008 | Post-doctoral research fellow for the Flemish Science Fund (FWO) at the University of Antwerp |
| 2/2009–6/2009 | Part time high school teacher at KAB in Antwerp. |
| 1/2009–1/2013 | Lecturer in mathematics at the University of Newcastle. |
| 1/2013–Now | Lecturer in mathematics at the University of Amsterdam. |
| 9/2021–Now | Program director of the Bachelor Mathematics at the University of Amsterdam. |

## Teaching

At Koninklijk Atheneum Berchem:

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| 02/2009-06/2009 | Chemistry and Physics for 16-17 year old high school students |

At the University of Antwerp:

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| 1999–2006 | Exercises classes in Algebra, Commutative Algebra and Differential Geometry for 3rd year mathematics students |
| 2003–2008 | Full Courses on Representation Theory, Coding Theory and Cryptography and Differential Geometry II for 3rd and 4th year mathematics students |
| 2005–2008 | Advanced Master Courses in Geometric Invariant theory, Kleinian Singularities and Knot theory |

At the University of Newcastle:

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| 2009–2012 | *Linear Algebra* for 2nd year mathematics students |
| 2009–2012 | *Coding Theory* for 3rd year mathematics students |

At the University of Amsterdam:

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| 2013–2017 | *Van orde tot chaos* for 2nd year beta-gamma students |
| 2014–2018 | *Algebra I* for 1st year Bachelor Mathematics students |
| 2018–2020 | *Topologie* for 2nd year Bachelor Mathematics students |
| 2016–Now | *Mirror Symmetry* and *Blowups and deformations* for Master Mathematics students. |
| 2019 | *Basiswiskunde* for 1st year Bachelor Mathematics students |
| 2021 | *Itereren en Visualizeren* for 1st year Bachelor Mathematics students |

Supervising:

Supervisor of several bachelor ($\pm20$) and master projects ($\pm15$) at the universities of Antwerp, Newcastle and Amsterdam.

Cosupervisor of the graduate thesis of Nick Loughlin (2011-2012) at the university of Newcastle and Jasper van de Kreeke at the University of Amsterdam (2018-Now).

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## COMMITTEES

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| 2004–2008 | Member of the Educational Committee for the department of Mathematics at the University of Antwerp. |
| 2009–2012 | Member of the Staff-Student Committee for the school of Mathematics at the University of Newcastle. |
| 2018–Now | Member of Wiskforall Committee. |
| 2018–Now | Member of the program committee for Nationale Wiskunde Dagen. |
| 2019–Now | Member of the curriculum reform committee of the Bachelor Mathematics. |
| 2020–Now | Chair of the Outreach Committee of the KdVi. |

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## EDITING

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| 2018–Now | Chief editor of Nieuw Archief voor Wiskunde. |
| 2016–2022 | Editor for London Mathematical Society. |

## Outreach and Science Popularization

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| 2005–2008 | I gave several lectures about connections between geometry, algebra and its applications to cryptography and GPS-systems in Belgium to high school students and high school teachers. |
| 2013–Now | I gave several lectures to students, prospective students and the general public at the UvA on outreach events (Open days, Leve de Wiskunde, Ouderdag, ...) |
| 2018–Now | Speaker and co-organizer for the Nationale Wiskunde Dagen (Tropical Geometry, GPS-systems, Math Pub quiz) |
| 2018 | Speaker for L.E.J. Brouwer, 50 years later |
| 2019 | Speaker for Universiteit van Nederland. Title: Hoe vind je een gat in een onzichtbare ruimte (`https://www.youtube.com/watch?v=1zVAPVUHrF0`). |
| 2022 | Speaker for Aïda Paalman-de Miranda Symposium 2022 |
| 2023 | Metamusical evening with Petra Cini in Amsterdam and Den Haag |

## Research

I work in the field of geometric representation theory with applications to mathematical physics. In particular my interests are in the following areas.

- Representation theory of quivers

- Resolutions of singularities

- Noncommutative geometry

- Geometric invariant theory

- Homological mirror symmetry

Below is a short selection of most cited papers. An overview of my publications can be found on `https://mathscinet.ams.org/mathscinet/`.

- Bocklandt, Raf. "Noncommutative mirror symmetry for punctured surfaces." Transactions of the American Mathematical Society 368.1 (2016): 429-469.

- Bocklandt, Raf. "A dimer abc." Bulletin of the London Mathematical Society 48.3 (2016): 387-451.

- Bocklandt, Raf. "Consistency conditions for dimer models." Glasgow Mathematical Journal 54.2 (2012): 429-447.

- Bocklandt, Raf, Travis Schedler, and Michael Wemyss. "Superpotentials and higher order derivations." Journal of pure and applied algebra 214.9 (2010): 1501-1522.

- Bocklandt, Raf. "Graded Calabi Yau algebras of dimension 3." Journal of pure and applied algebra 212.1 (2008): 14-32.

I also have written a book on Homological Mirror Symmetry

Bocklandt, Raf; A gentle introduction to homological mirror symmetry. London Mathematical Society Student Texts, 99. Cambridge University Press, Cambridge, 2021. xi+390 pp. ISBN: 978-1-108-48350-6;

Together with Sergey Shadrin and Hessel Posthuma we obtained an NWO-grant 'Grant Algebraic methods and structures in the theory of Frobenius manifolds and their applications' (TOPl.17.012).

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## Publication List

- Bocklandt, Raf; *A gentle introduction to homological mirror symmetry.* London Mathematical Society Student Texts, 99. Cambridge University Press, Cambridge, 2021. xi+390 pp. ISBN: 978-1-108-48350-6;

- Bocklandt, Raf; *The Scottish Book.* Nieuw Arch. Wiskd. (5) 23 (2022), no. 3, 140-142.

- Bocklandt, Raf; *A testimonial of troubled times.* Nieuw Arch. Wiskd. (5) 22 (2021), no. 2, 181-184.

- Bocklandt, Raf; Nicos Starreveld; *Interview with Avi Wigderson: A look at mathematics through the lens of computation* Nieuw Arch. Wiskd. (5) 23 (2022), no. 1, 26-29.

- Bocklandt, Raf; Nicos Starreveld; *Interview with László Lovász: On graphs and graphons* Nieuw Arch. Wiskd. (5) 22 (2021), no. 2, 146-153.

- Bocklandt, Raf; Craw, Alastair; Quintero Vélez, Alexander; *Correction to: Geometric Reid's recipe for dimer models.* Math. Ann. 380 (2021), no. 1-2, 911–913.

- Bocklandt, Raf; *Wolf prize 2018: a small suggestion with major implications.* Nieuw Arch. Wiskd. (5) 20 (2019), no. 1, 19–21.

- Bocklandt, Raf; Starreveld Nicos; *A passion for patterns, puzzles and physics. Interview with Sir Roger Penrose.* Nieuw Arch. Wiskd. (5) 19 (2018), no. 4, 241–245.

- Bocklandt, Raf; *Reflections in a cup of coffee.* Indag. Math. (N.S.) 29 (2018), no. 1, 150–160. 55-03

- Bocklandt, Raf; Galluzzi, Federica; Vaccarino, Francesco; *The Nori-Hilbert scheme is not smooth for 2-Calabi-Yau algebras.* J. Noncommut. Geom. 10 (2016), no. 2, 745–774.

- Bocklandt, Raf; *A dimer ABC.* Bull. Lond. Math. Soc. 48 (2016), no. 3, 387–451. 82B20

- Bocklandt, Raf; *Noncommutative mirror symmetry for punctured surfaces. With an appendix by Mohammed Abouzaid.* Trans. Amer. Math. Soc. 368 (2016), no. 1, 429–469.

- Bocklandt, Raf; Craw, Alastair; Quintero Vélez, Alexander; *Geometric Reid's recipe for dimer models.* Math. Ann. 361 (2015), no. 3-4, 689–723.

- Bocklandt, Raf; *Toric systems and mirror symmetry.* Compos. Math. 149 (2013), no. 11, 1839–1855.

- Bocklandt, Raf; *Calabi-Yau algebras and weighted quiver polyhedra.* Math. Z. 273 (2013), no. 1-2, 311-329.

- Bocklandt, Raf; *Generating toric noncommutative crepant resolutions.* J. Algebra 364 (2012), 119–147.

- Bocklandt, Raf; *Consistency conditions for dimer models.* Glasg. Math. J. 54 (2012), no. 2, 429–447.

- Bocklandt, Raf; *A slice theorem for quivers with an involution.* J. Algebra Appl. 9 (2010), no. 3, 339–363.

- Bocklandt, Raf; Schedler, Travis; Wemyss, Michael; *Superpotentials and higher order derivations.* J. Pure Appl. Algebra 214 (2010), no. 9, 1501–1522.

- Bocklandt, Raf; Van de Weyer, Geert; *The power of slicing in noncommutative geometry.* Bull. Belg. Math. Soc. Simon Stevin 15 (2008), no. 2, 303–310.

- Bocklandt, Raf; Van de Weyer, Geert; *Cofree quiver settings.* J. Algebra 319 (2008), no. 5, 2082–2105.

- Bocklandt, Raf; *Graded Calabi Yau algebras of dimension 3.* J. Pure Appl. Algebra 212 (2008), no. 1, 14–32.

- Bocklandt, Raf; Symens, Stijn; *The local structure of graded representations.* Comm. Algebra 34 (2006), no. 12, 4401–4426.

- Bocklandt, Raf; Symens, Stijn; Van de Weyer, Geert; *The flat locus of Brauer-Severi fibrations of smooth orders.* J. Algebra 297 (2006), no. 1, 101–124.

- Bocklandt, Raf; *Quiver quotient varieties and complete intersections.* Algebr. Represent. Theory 8 (2005), no. 1, 127–145.

- Bocklandt, Raf; Le Bruyn, Lieven; Van de Weyer, Geert *Smooth order singularities.* J. Algebra Appl. 2 (2003), no. 4, 365–395.

- Bocklandt, Raf; Le Bruyn, Lieven; Symens, Stijn *Isolated singularities, smooth orders, and Auslander regularity.* Comm. Algebra 31 (2003), no. 12, 6019–6036.

- Bocklandt, Raf *Symmetric quiver settings with a regular ring of invariants.* Special issue on linear algebra methods in representation theory. Linear Algebra Appl. 365 (2003), 25–43.

- Bocklandt, Raf *The geometry of quotient varieties of quivers.* Thesis (Ph.D.)–Universitaire Instelling Antwerpen (Belgium). 2002. 92 pp. ISBN: 978-0493-93764-9.

- Bocklandt, Raf *Smooth quiver representation spaces.* J. Algebra 253 (2002), no. 2, 296–313.

- Adriaenssens, Jan; Bocklandt, Raf; Van de Weyer, Geert; *Smooth character varieties for torus knot groups.* Comm. Algebra 30 (2002), no. 6, 3045–3061.

- Bocklandt, Raf; Le Bruyn, Lieven; *Necklace Lie algebras and noncommutative symplectic geometry.* Math. Z. 240 (2002), no. 1, 141–167.