Bart Vlaar *Curriculum vitae*

Professional experience

Sept. 2022 – now **Associate Professor**
Beijing Institute of Mathematical Sciences and Applications.

Oct. 2021 – Aug. 2022 **Visiting postdoctoral researcher**
Max Planck Institute for Mathematics, Bonn (host: Prof. Catharina Stroppel)

Apr. 2018 – Sept. 2021 **Research Associate**
Heriot-Watt University, School of Mathematical and Computer Sciences
Supervisor: Prof. Robert Weston Funding: EPSRC

Oct. 2016 – March 2018 **Research Associate** - University of York, Department of Mathematics
Supervisor: Prof. Maxim Nazarov Funding: EPSRC

Jan. 2015 – Sept. 2016 **Research Fellow** - University of Nottingham, School of Mathematical Sciences
Supervisor: Dr. Sergey Oblezin Funding: EPSRC

Jan. 2012 – Dec. 2014 **Postdoctoral Researcher** - University of Amsterdam, Korteweg-de Vries Institute
Supervisors: Prof. Jasper Stokman, Prof. Nicolai Reshetikhin Funding: NWO

Education and qualifications

Oct. 2007 – Sept. 2011 **PhD (Mathematics)** - University of Glasgow, School of Mathematics and Statistics
Thesis: "The Quantum Inverse Scattering Method and Degenerate Affine Hecke Algebra"
Supervisor: Dr. Christian Korff Funding: EPSRC Award date: 7 March 2012.

Sept. 1997 – Aug. 2003 **MSc (Theoretical Physics)** - Utrecht University, Department of Physics and Astronomy
Dissertation: "Coherent atom-molecule oscillations" Supervisor: Prof. Henk Stoof.

Sept. 1997 – Nov. 2002 **MSc (Pure Mathematics)** - Utrecht University, Department of Mathematics
Dissertation: "Dihedral Extensions and Modular Forms" Supervisor: Prof. Frits Beukers.

Research interests

Quasitriangular Hopf algebras and braided tensor categories, Lie and Kac-Moody theory, quantum groups, quantum symmetric pairs and boundary quantum groups. Hecke algebras, Coxeter and braid groups, Schur-Weyl duality. Quantum integrability (algebraic Bethe ansatz, Baxter's Q-operator, quantum KZ equations).

Publications and preprints

- Cooper, Vlaar & Weston (2023): *A Q-operator for open spin chains II: boundary factorization*. Preprint at arXiv:2301.03997
- Vlaar (2023): *A companion to quantum groups*. Lecture notes, in Modern Trends in Algebra and Representation Theory **486**.
- Appel & Vlaar (2022): *Trigonometric K-matrices for finite-dimensional representations of quantum affine algebras*. Preprint at arXiv:2203.16503.
- Regelskis & Vlaar (2022): *Pseudo-symmetric pairs for Kac-Moody algebras*. In *Hypergeometry, Integrability and Lie Theory*, Contemp. Math. (AMS) **780**.
- Doikou, Ghionis & Vlaar (2022): *Quasi-bialgebras from set-theoretic type solutions of the Yang–Baxter equation*. Lett. Math. Phys. **112**.
- Appel & Vlaar (2022): *Universal K-matrices for quantum Kac-Moody algebras*. Represent. Theory **26**.
- Vlaar & Weston (2020): *A Q-operator for open chains I: Baxter's TQ relation*. J. Phys. A: Math. Theor. **53**.
- Regelskis & Vlaar (2020): *Quasitriangular coideal subalgebras of $U_q(\mathfrak{g})$ in terms of generalized Satake diagrams*. Bull. London Math. Soc. **52**.
- Regelskis & Vlaar (2018): *Solutions of the $U_q(\widehat{\mathfrak{sl}}_N)$ reflection equations*. J. Phys. A: Math. Theor. **51**.
- Reshetikhin, Stokman & Vlaar (2018): *Integral solutions to boundary quantum Knizhnik-Zamolodchikov equations*. Adv. Math. **323**.

- Regelskis & Vlaar (2016): *Reflection matrices, coideal subalgebras and generalized Satake diagrams of affine type*. Preprint at arXiv:1602.08471.
- Vlaar (2015): *Boundary transfer matrices and boundary quantum KZ equations*. Math. Phys. **56**.
- Reshetikhin, Stokman & Vlaar (2015): *Boundary quantum Knizhnik-Zamolodchikov equations and fusion*. Ann. Henri Poincaré, **17**.
- Stokman & Vlaar (2015): *Koornwinder polynomials and the XXZ spin chain*. J. Appr. Theory **197**.
- Reshetikhin, Stokman & Vlaar (2015): *Boundary quantum Knizhnik-Zamolodchikov equations and Bethe vectors*. Commun. Math. Phys. **336**.
- Vlaar (2013): *A non-symmetric Yang-Baxter algebra for the quantum nonlinear Schrödinger model*. J. Phys. A: Math. Theor. **46**.

Teaching experience

Spring 2023	*Infinite-dimensional Lie algebras*, BIMSA. Online graduate lectures.
Autumn 2022	*Quantum groups*, BIMSA. Online graduate lectures.
Spring 2020, 2021 & 2022	*Classical and Quantum Integrable Systems*, Scottish Mathematical Sciences Training Centre (supplementary module). Videolinked and online graduate lectures.
Nov. 2019 & Sept. 2021	*Thermodynamics and Statistical Mechanics*, Heriot-Watt University. Lectures and problem classes.
Spring 2021	*Complex analysis*, Heriot-Watt University. Online lectures and problem classes.
Nov. 2020	*Introduction to integrability*, supported by LMS. Online course for PhD students.
Oct. 2020	*Introduction to quantum groups*, supported by LMS. Online course for PhD students.
March 2018	*Representation theory of the symmetric group*, University of York. Lectures.
Spring 2017 & Autumn 2017	*Linear algebra*, University of York. Lectures, problem classes, tutorials, online tools; exam setting/marking; course design and development.
May 2017	*Groups, Rings and Fields*, University of York. Lectures.
Autumn 2012, 2013 & 2014	*Calculus*, Amsterdam University College. Lectures & tutorials for liberal arts and sciences students.
Spring 2012	*Calculus and linear algebra for physics*, University of Amsterdam. Tutorials.

Supervision

Sept. 2023 – now	*PhD student supervisor*, BIMSA (joint programme with the University of the Chinese Academy of Sciences).
2018 – 2023	*PhD student co-supervisor*, Heriot-Watt University (with R. Weston).
Summer 2020	*Second supervisor of MSc thesis*, Heriot-Watt University (with R. Weston).
Spring 2020	*Co-supervisor of three 4th year projects*, Heriot-Watt University (with R. Weston).
Spring 2014	*Bachelor project co-supervisor*, University of Amsterdam (with J. Stokman).

Additional responsibilities

2018 – 2021	Co-organizer of Edinburgh Mathematical Physics Group seminars.
2016 – 2018	Postdoctoral representative for Equality & Good Practice Committee, University of York.
2016 – 2018	Co-convener of Integrability Study Group, University of York.

Outreach

2016 – 2020	UK Mathematics Trust: volunteer for Circle Events, Mentoring Scheme, Summer Schools.
Autumn 2019	Royal Institution Mathematics Masterclasses, Edinburgh.
Summer 2017	YESS Residentials, University of York: mathematics taster sessions for high school students.

Grant writing experience

Mar. 2023 Application to the National High Level Talent Programme, China.
Jan. 2022 Successful application to the MPIM Guest Program (extension of 4 months).
June 2021 Successful application to the MPIM Guest Program (6 months).
July 2020 EPSRC Early Career Fellowship. Assessment by external referees: 5/6, 5/6, 5/6.
Jan. 2015 NWO Veni Talent Programme. Assessment by external referees: A+, A.
Nov. 2014 Successful application to the MPIM Guest Program (11 months).
Jan. 2014 NWO Veni Talent Programme. Assessment by external referees: A, B.

Conference organization

July 2023 *RTISART-23 (Representation Theory, Integrable Systems & Related Topics)*, BIMSA, Beijing (co-organizer).
July 2023 *ICBS 2023*, BIMSA, Beijing (ICBS Translation Team, ICBS On-site Team).
Dec. 2020 *Hypergeometry, Integrability and Lie Theory*, Lorentz Center, Leiden University.
July 2016 *ASIDE summer school*, Université de Montréal.
June 2016 *Infinite-Dimensional Geometry and Harmonic Analysis*, University of Nottingham.

Editorial work

2021 – 2022 Special issue *Hypergeometry, Integrability and Lie Theory*, Contemp. Math. (AMS).

Refereeing

Advances in Applied Clifford Algebras
Communications in Mathematical Physics
Indagationes Mathematicae
Journal of Mathematical Analysis and Applications
Journal of Physics A: Mathematical and Theoretical
Journal of Statistics: Theory and Experiment
Mathematische Zeitschrift
Pure and Applied Mathematics Quarterly
Representation Theory (AMS)
Selecta Mathematica
Transformation Groups

Talks at upcoming and recent conferences and seminars

June 2024 *Yang-Baxter algebras*, Heriot-Watt University, Edinburgh.
Oct. 2023 *Geometric Representation theory seminar*, YMSC, Beijing.
May 2023 *Workshop on Integrable Systems*, BIMSA, Beijing.
Jan. 2023 *EMPG seminar*, Maxwell Institute, Edinburgh.
Nov. 2022 *Workshop on String Theory*, Tsinghua Sanya International Mathematics Forum.
Sept. 2022 *Integrable systems, exactly solvable models and algebras*, CRM, Univ. de Montréal.
June 2022 *UCL-ULB-VUB Seminar on Quantum Groups, Hopf algebras and monoidal categories*, Vrije Universiteit Brussel.
May 2022 *768. WE-Heraeus Seminar: Integrable Quantum Many-Body Systems*, Physikzentrum Bad Honnef.
Mar. 2022 *Mini-Workshop: Recente Developments in Representation Theory and Mathematical Physics*, MFO (Oberwolfach).
Mar. 2022 *MPI-Oberseminar*, Max Planck Institute for Mathematics, Bonn.
Dec. 2021 *Winter school: Geometry and Analysis of Quantum Groups*, University of Oslo.
Oct. 2021 *Mini-Workshop: Three Facets of R-matrices*, MFO (Oberwolfach).
Febr. 2021 *Algebra Seminar*, University of York.
Dec. 2020 *Hypergeometry, Integrability and Lie Theory*, Lorentz Center, Universiteit Leiden.

Nov. 2020 *Noncommutative Geometry and Topology Seminar*, Charles University, Prague.