

CURRICULUM VITAE

Jun.-Prof. Simon Lentner

Department of Mathematics, University of Hamburg

Bundesstraße 55, 20146 Hamburg

Phone: +49 40 42838 5194

E-Mail: Simon.Lentner@uni-hamburg.de

Website: <http://simon.lentner.net>



Born 8. June 1985 in Rosenheim (Germany), three children.

Employment.

- 2022 - 2023 Feodor-Lynen scholarship at the University of Alberta (T. Gannon, T. Creutzig)
- 2021 - 2022 Substitute Full Professor (W3) for Algebra, Christian-Albrechts-Universität Kiel
- 2016 - 2023 Junior Professor (W1) for Algebra and Number Theory, University of Hamburg
- 2015 - 2016 Postdoctoral researcher, Lebedev Physical Institute, Moscow (B. Feigin, A. Semikhatov)
- 2013 - 2015 Postdoctoral assistant, University of Hamburg, Mathematics (C. Schweigert)
- 2011 - 2013 Founder of the software company PerfectPattern GmbH, Munich,
(a university spinoff company with today 12 employees)

Education.

- 2008 - 2012 Ph.D. student in Mathematics at LMU Munich
Thesis: Orbifoldizing Hopf- and Nichols-Algebras (M. Schottenloher)
- 2004 - 2008 Diploma student in Mathematics with Theoretical Physics at LMU Munich
Thesis: Vertex Algebras Constructed from Hopf Algebra Structures (M. Schottenloher)
- 2002 - 2004 University during highschool as "LMU Schüler-Student" (O. Forster, Y. Sommerhäuser)

Fellowships, Scholarships, Grants (details below).

- 2022 - 2023 Feodor-Lynen scholarship at the University of Alberta (T. Gannon, T. Creutzig)
- 2022 - 2023 University didactics funding for the Virtual Rubik's Cube
- 2019 - 2022 Hamburg main Applicant of the Humboldt Institute Partnership Cordoba/Hamburg/Marburg
- 2016 - 2021 Elected Fellow of the Young Academy of Science (Junge Akademie), Berlin
- 2016 - 2020 Principal investigator in the DFG Research Training Group 1670
"Mathematics inspired by string theory and quantum field theory"
- 2015 - 2016 Research Grant ("Prime", DAAD, BMBF, EU Marie Curie Actions)
- 2012 - 2013 Startup Grant ("Flügel", Ministry of Science StMWFK)
- 2011 - 2012 Startup Scholarship ("Exist", Ministry of Economy BMWi)
- 2008 - 2011 Doctorate Scholarship (Studienstiftung des deutschen Volkes)

LIST OF PUBLICATIONS

- [19] I. Angiono, S. Lentner, G. Sanmarco: Pointed Hopf algebras over non-abelian groups with non-simple standard braidings, accepted for publication in Proceedings of the London Mathematical Society (2023)
- [18] S. Lentner, S. Mierach, C. Schweigert, Y. Sommerhäuser: Hochschild Cohomology, Modular Tensor Categories, and Mapping Class Groups, Springer Briefs in Mathematical Physics 44 (2022), ISSN 2197-1757 .
- [17] S. Lentner, I. Flandoli: Algebras of non-local screenings and diagonal Nichols algebras, SIGMA 18 (2022).
- [16] S. Lentner: Quantum groups and Nichols algebras acting on conformal field theories, Advances in Mathematics 378 (2021) 107517.
- [15] S. Lentner, K. Vocke: A family of new Borel subalgebras of quantum groups, Algebra and Representation Theory (2020), p. 473-503.
- [14] S. Lentner: The unrolled quantum group inside Lusztig's quantum group of divided powers, Letters in Mathematical Physics 109/7 (2019), p. 1665-1682.
- [13] S. Lentner, S. Mierach, C. Schweigert, Y. Sommerhäuser: Hochschild cohomology and the Modular Group, Journal of Algebra 507 (2018), p. 400-420.
- [12] I. Flandoli, S. Lentner: Logarithmic conformal field theories of type B_n , $\ell = 4$ and symplectic fermions, Journal of Mathematical Physics 59 (2018), 071101.
- [11] S. Lentner, J. Priel: On monoidal autoequivalences of the category of Yetter-Drinfeld modules over a group: The lazy case, Algebra and Representation Theory 22/4 (2018), p. 1017-1049.
- [10] S. Lentner, J. Priel: Three natural subgroups of the Brauer-Picard group of a Hopf algebra with applications, Bull. Belg. Math. Soc. Simon Stevin 24 (2017), p. 1-34.
- [9] S. Lentner, T. Ohrmann: Factorizable R-matrices for small quantum groups, SIGMA 13 (2017).
- [8] S. Lentner, J. Priel: A decomposition of the Brauer-Picard group of the representation category of a finite group, Journal of Algebra 489 (2017), p. 264-309.
- [7] S. Lentner, A. Lochmann: Factorization of graded traces on Nichols algebras, Axioms 6/4, Special Issue "Hopf Algebras, Quantum Groups and Yang-Baxter Equations"

(2017), 32.

[6] S. Lentner: A Frobenius homomorphism for Lusztig's quantum groups over arbitrary roots of unity, Comm. in Contemporary Mathematics 18/3 (2016), 1550040.

[5] M. Cuntz, S. Lentner: A simplicial complex of Nichols algebras, Mathematische Zeitschrift 4 (2015), p. 1-37.

[4] S. Lentner, D. Nett: New R-matrices for small quantum groups, Algebras and Representation Theory 18/6 (2015), p. 1649-1673.

[3] A. Barvels, S. Lentner, C. Schweigert: Partially dualized Hopf algebras have equivalent Yetter-Drinfel'd Modules, Journal of Algebra 430 (2015), p. 303-342.

[2] S. Lentner: Root systems in finite symplectic vector space, Communications in Algebra, 43 (2015), p. 4446-4470.

[1] S. Lentner: New large-rank Nichols algebras over nonabelian groups with commutator subgroup \mathbb{Z}_2 , Journal of Algebra 419C (2014), p. 1-33.

Recent Preprints. All preprints can be retrieved at http://arxiv.org/a/lentner_s_1

[6P] T. Creutzig, S. Lentner, M. Rupert: An algebraic theory for logarithmic Kazhdan-Lusztig correspondences, Preprint (2023) arXiv:2306.11492.

[5P] B. Feigin, S. Lentner: Vertex algebras with big center and a Kazhdan-Lusztig Correspondence, Preprint (2022) arXiv:2210.13337.

[4P] R. Allen, S. Lentner, C. Schweigert, S. Wood: Duality structures for module categories of vertex operator algebras and the Feigin Fuchs boson, Preprint (2021), arXiv:2107.05718.

[3P] T. Creutzig, S. Lentner, M. Rupert: Characterizing braided tensor categories associated to logarithmic vertex operator algebras, Preprint (2021), arXiv:2104.13262.

[2P] S. Lentner, K. Vocke: On Borel subalgebras of quantum groups, Preprint (2019), arXiv: 1905.05867.

[1P] A. Gainutdinov, S. Lentner, T. Ohrmann: Modularization of small quantum groups, Preprint (2018), arXiv: 1809.02116.

GRANTS

Leading applicant for successful grants.

2022 - 2023 € 58.000	Feodor-Lynen scholarship for experienced scientists Research stay at the University of Alberta (T. Gannon, T. Creutzig)
2022 - 2023 € 8.000	University didactics funding for the Virtual Rubik's Cube Class set of bluetooth cubes and programming assistance.
2019 - 2022 € 55.000	Humboldt program for institute partnerships Cordoba, Hamburg, Marburg (main responsible applicant for Hamburg) Travel- and workshop costs
2015 - 2016 € 121.814	Postdoc Research grant "Prime" (DAAD, BMBF, Marie Curie actions) Own position for Moscow and later Hamburg. <i>Quantum groups and logarithmic conformal field theories</i>
2013 - 2015 € 219.536	University part in Joint Project "KMU-Innovativ" (BMBF) Product development between LMU, PerfectPattern GmbH & Intomedia GmbH <i>Entwicklung einer ressourcenoptimierten Zuschnittsteuerung für die Druckbranche</i>
2012 - 2014 € 113.230	Technology Transfer Project "Flügge" (StMWFK Bavaria) Three E13/2 positions (including my own) for company foundation <i>Projekt PerfectPrintPattern / Gründung PerfectPattern GmbH</i>
2011 - 6/2012 € 97.100	StartUp Foundation Program "Exist" (BMWi Germany) Three scholarships (including my own)

TEACHING EXPERIENCE

Lectures and Seminars.

WS 2023	Lecture: <i>Theory of functions in one complex variable</i> (University of Alberta)
SS 2022	Seminar: <i>Permutations and the Rubik cube</i>
SS 2022	Seminar: <i>Representation theory of groups with applications in physics</i>
WS 2021	Lecture for teachers: <i>Algebra</i> (University of Kiel)
WS 2021	Seminar: <i>Hopf algebras and tensor categories</i> (University of Kiel)
SS 2021	Lecture: <i>Mathematics 2 for Physics, Geoscience, Oceanography, Meteorology</i>
WS 2020	Lecture: <i>Mathematics 1 for Physics, Geoscience, Oceanography, Meteorology</i>
SS 2020	Block seminar: <i>Vertex Algebras, Tensor Categories, Quantum groups.</i>
WS 2019	Seminar: <i>Representation theory and conformal field theory</i>
WS 2019	2-Week Preparation Course: <i>Bachelor Mathematics</i>
SS 2019	Seminar for teachers: <i>Elementary number theory</i>
SS 2019	Seminar: <i>Algebra and tensor categories</i>
WS 2018	(research semester with stays in USA and Moscow)
SS 2018	Seminar: <i>p-adic analysis and the zeta function</i>
SS 2018	Seminar for teachers: <i>Elementary group theory</i>
SS 2018	Seminar: (softskills) <i>Presentation skills</i>
WS 2017	Lecture: <i>Elliptic curves and modular forms</i>
SS 2017	Lecture: <i>Complex analysis</i>

2016-2017 research position in Moscow

SS 2015	Seminar: <i>Root systems and Lie algebras</i>
WS 2014	Seminar: <i>Representation theory of finite groups</i>
WS 2014	Preparation Course: <i>Master Mathematical Physics</i>
WS 2013	Preparation Course: <i>Master Mathematical Physics</i>

SS 2011	Lecture: <i>Finite groups and their Nichols Algebras</i>
WS 2010	Seminar: <i>Game Theory with Many Players and Statistical Physics</i>
SS 2010	Lecture: <i>Hopf Algebras Generating Fusion Rings & Topological Invariant'</i>

2010-2015 Teaching assistant for 6 lectures

Upon request I can make existing evaluations available.

Student theses supervision (Hamburg).

- 9/2022 Jannick Görcks (Bachelor)
Generalized Selberg integrals in two examples
- 12/2021 Johann Hespén (Master)
Derived modular tensor categories and the small quantum group
- 6/2020 Ilaria Flandoli (PhD)
Nichols algebras and logarithmic conformal field theories
- 6/2020 Svea Mierach (PhD, joint with Memorial University, Y. Sommerhäuser)
Hochschild cohomology, modular tensor categories and mapping class groups
- 3/2020 Marc Hildebrandt (Bachelor in mathematics)
Indefinite theta functions and infinite orbifold models.
- 11/2019 Johann Hespén (Bachelor in mathematics)
L-Reihen und Modulformen im Nulldimensionalen
- 10/2019 Daniela Rehbock (Bachelor in mathematics for teachers)
joint with Ann Sophie Stuhlmann, Didactics Department
Permutationsgruppen und didaktische Ausgestaltung
- 7/2018 Matthias Lienau (Bachelor in mathematics)
Representations of groups and Hopf algebras
- 6/2018 Tobias Ohrmann (PhD, joint with C. Schweigert)
Factorizable (quasi-)quantum groups
- 7/2017 Ilaria Flandoli (Master in mathematical physics, Erasmus)
Logarithmic conformal field theory of type $B_n, \ell = 4$ and symplectic fermions

Participation in student theses as teaching assistant (Hamburg/Munich).

- 6/2016 Jan Priel (PhD thesis, Prof. Schweigert)
Symmetries of 3d-TQFTs and the Brauer-Picard Group
- 3/2015 Daniel Nett (PhD thesis, Prof. Schweigert)
New R-matrices for small quantum groups
- 7/2014 Alexander Barvels (PhD thesis, Prof. Schweigert)
Equivariantly extended Drinfel'd Centers and Partially dualized Hopf Algebras
-
- 12/2011 Lisa Kraus (Diploma thesis, Prof. Schottenloher)
Game-Theory of the Stock Market and Statistical Physics
- 12/2010 Karolina Vocke (Diploma thesis, Prof. Schottenloher)
Anyonmodels from Hopf algebras

CONFERENCES AND RESEARCH STAYS

Conferences as main organizer.

- 22.5. - 26.5. 2023 University of Marburg (Humboldt Institute Partnership)
Hopf Algebra and Tensor Categories II
- 17.8. - 21.8. 2020 Hybrid Conference, University of Hamburg (Humboldt Institute Partnership)
Hopf Algebra and Tensor Categories
- 26.8. - 30.8. 2019 Summerschool, University of Hamburg
Algebraic Structures in Quantum Field Theory
- 12.8. - 16.8. 2019 Workshop, FU Berlin
Path integrals and their applications

Research Stays Abroad.

- 10.10. - 4.11. 2023 Simon CRM Scholar in Residence, Montreal, Topic month: Quantum Symmetries
Four lectures: Tensor categories, quantum groups and conformal field theory.
- 9.11. - 20.11. 2020 Series of four online lectures at ESI, Vienna (N. Carqueville).
- 23.2. - 15.3. 2019 HSE Moscow (B. Feigin)
- 22.9. - 3.11. 2018 MIT, Boston and Rutgers, NJ (P. Etingof, Y.-Z. Huang)
- 21.2. - 16.3. 2018 Lebedev Physical Institute, Moscow (B. Feigin, A. Semikhatov)
- 25.9. - 5.10. 2017 SUNY, Albany and MIT, Boston (A. Milas, T. Arakawa, P. Etingof)
- 6.2. - 9.2. 2017 Philipps-University Marburg (I. Heckenberger)
- 18.2. - 4.3. 2016 Universities of Córdoba and Buenos Aires (N. Andruskiewitsch, L. Vendramin)
- 4.5. - 8.5. 2015 Erwin Schrödinger Institute, Vienna, (N. Carqueville)
- 27.4. - 1.5. 2015 Max Planck Institute, Bonn (I. Angiono, G. Williamson)
- 25.2. - 14.3. 2015 Universities of Córdoba and Buenos Aires (N. Andruskiewitsch, L. Vendramin)
- 18.11. - 22.11. 2014 Philipps-University Marburg (I. Heckenberger)
- 25.9. - 6.10. 2014 Lebedev Physical Institute, Moscow (A. Semikhatov, I. Tipunin)
- 27.5. - 31.5. 2014 Philipps-University Marburg (I. Heckenberger)

Conference Talks.

- 27.10. 2022 Quantum Symmetries (CRM, Montreal)
Vertex algebras and quantum groups with big center
- 29.7. 2022 Hopf algebras, monoidal categories and related topics, Bucharest.
Quasi quantum groups and folded quantum groups
- 5.11. 2021 Quantum Field Theories and Quantum Topology Beyond Semisimplicity (BANFF)
Characterizing braided tensor categories associated to logarithmic vertex operator algebras.
- 16.9. 2021 Latin-American Mathematics Congress (CLAM)
Quantum symmetries in quantum field theories
- 21.8. 2020 Hopf Algebras and Tensor Categories, Hamburg / Humboldt Institute Partnership
Vertex algebras and their representation theory
- 30.6. 2020 57th ARTIN Meeting, University of Nottingham.
Nonsemisimple modular tensor categories and quantum field theory
- 10.9. 2019 International Workshop on Hopf Algebras and Tensor Categories, Nanjing, China.
Nichols algebra in braided tensor categories and screening operators in CFT
- 13.6. 2019 Conformal field theory, in honor of Yi-Zhi Huang's 60th birthday, Tianjin, China.
Nichols algebras and Screening operators on Vertex algebra representation categories
- 18.2. 2019 Preparatory workshop for a planned IRTG Hamburg-Tokyo
Mapping class groups, Hochschild cohomology and modular tensor categories
- 23.1. 2018 Tensor categories, Hopf algebras and quantum groups, Marburg.
Nichols algebras acting on conformal field theories
- 10.12. 2017 Affine, Vertex and W-algebras, Rome.
Quantum groups and Nichols algebras acting by screening operators
- 23.9. 2015 Annual meeting of the German Mathematical Society (DMV), Hamburg.
Quantum groups and logarithmic conformal field theories
- 5.6. 2015 New trends in Hopf algebras and tensor categories, Brussels.
A decomposition of the Brauer-Picard group
- 6.3. 2015 Quantum 2015, Córdoba
Quantum groups at a small root of unity
- 20.4. 2015 Coideal Subalgebras of Quantum groups, Oberwolfach.
Different types of Quantum groups and the Frobenius homomorphism
- 25.8. 2014 Conformal Field Theory and Nichols Algebras, Rauschholzhausen/Marburg.
Construction of large rank Nichols algebras
- 17.4. 2014 Infinite-dimensional Hopf algebras, Oberwolfach.
Folding Nichols algebras and quantum groups
- 25.3 2014 Annual conference of the DFG SPP 1388 Representation Theory, Soltau
Partially dualized Hopf algebras have equivalent Yetter-Drinfeld modules
- 30.9. 2010 Deformations in Mathematical Physics, Oberwolfach.
Nichols Algebras Over Nilpotent Groups