

# CURRICULUM VITAE

## **Jun.-Prof. Simon Lentner**

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Born 8.6.1985 in Rosenheim, Germany.

## **Employment.**

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- 2016 - 2022 Junior Professor (W1) for Algebra and Number Theory, University of Hamburg  
Positive midterm evaluation in 9/2019
- 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 11 employees and a net worth of 10 Mio. €)

## **Education.**

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- 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 minor Theoretical Physics at LMU Munich  
Thesis: Vertex Algebras Constructed from Hopf Algebra Structures (M. Schottenloher)
- 2002 - 2004 University during highschool "LMU Schülerstudent" (O. Forster, Y. Sommerhäuser)

## **Fellowships, Scholarships, Grants (details below).**

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- 2019 - 2022 Humboldt Institute Partnership Cordoba, Hamburg, Marburg (Hamburg applicant)
- 2016 - now Elected Fellow of the Young Academy of Science (Junge Akademie), Berlin
- 2016 - now 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 ("Flügge", Ministry of Science StMWFK)
- 2011 - 2012 Startup Scholarship ("Exist", Ministry of Economy BMWi)
- 2008 - 2011 Doctorate Scholarship (Studienstiftung des deutschen Volkes)

## LIST OF PUBLICATIONS

- [15] S. Lentner, S. Mierach, C. Schweigert, Y. Sommerhäuser: Hochschild cohomology and the Modular Group, *Journal of Algebra* 507 (2018), p. 400-420. arXiv:1707.04032
- [14] I. Flandoli, S. Lentner: Logarithmic conformal field theories of type  $B_n$ ,  $\ell = 4$  and symplectic fermions, *Journal of Mathematical Physics* 59 (2018). arXiv:1706.07994
- [13] S. Lentner, K. Vocke: A family of new Borel subalgebras of quantum groups, to appear in *Algebra and Representation Theory*. arXiv:1702.06223
- [12] S. Lentner: The unrolled quantum group inside Lusztig's quantum group of divided powers, *Letters in Mathematical Physics* 109/7 (2019), p. 1665-1682. arXiv:1702.05164
- [11] 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. arXiv:1702.05133.
- [10] S. Lentner, T. Ohrmann: Factorizable R-matrices for small quantum groups, *SIGMA* 13 (2017). arXiv:1612.07960
- [9] 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, arXiv:1511.03871.
- [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. arXiv:1506.07832.
- [7] M. Cuntz, S. Lentner: A simplicial complex of Nichols algebras, *Mathematische Zeitschrift* 4 (2015), p. 1-37. arXiv:1503.08117.
- [6] S. Lentner, D. Nett: New R-matrices for small quantum groups, *Algebras and Representation Theory* 18/6 (2015), p. 1649-1673. arXiv:1409.5824.
- [5] S. Lentner: A Frobenius homomorphism for Lusztig's quantum groups over arbitrary roots of unity, *Communications in Contemporary Mathematics* 18/3 (2015), arXiv:1406.0865.

[4] 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), arXiv:1403.4287.

[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. arXiv:1402.2214.

[2] S. Lentner: Root systems in finite symplectic vector space, Communications in Algebra, 43 (2015), p. 4446-4470. arXiv:1307.7151.

[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. arXiv:1306.5684.

**Recent Preprints.** All preprints can be retrieved at [http://arxiv.org/a/lentner\\_s\\_1](http://arxiv.org/a/lentner_s_1)

[4P] S. Lentner, I. Flandoli: Algebras of non-local screenings and diagonal Nichols algebras, Preprint (2019), arXiv:1911.11040.

[3P] S. Lentner, K. Vocke: On Borel subalgebras of quantum groups, Preprint (2019), arXiv: 1905.05867.

[2P] A. Gainutdinov, S. Lentner, T. Ohrmann: Modularization of small quantum groups, Preprint (2018), arXiv: 1809.02116.

[1P] S. Lentner: Quantum groups and Nichols algebras acting on conformal field theories, Preprint (2017), arXiv: 1702.06431.

**Author of company patents (pending).**

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- 10 2013 101 604.9 Combinatorial optimization of printing layouts  
(S. Lentner)
- 10 2013 103 167.6 Combinatorial optimization of wood cutting  
(M. Schottenloher, S. Lentner, L. Lentner, C. Paleani, R. Meißner)
- 10 2013 103 169.2 Combinatorial optimization of cutting processes  
(M. Schottenloher, S. Lentner, L. Lentner, C. Paleani, R. Meißner)

## GRANTS

### **Leading applicant for successful grants.**

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>Entwicklungen 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 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 &amp; Topological Invariant</i>
2010-2015	Also teaching assistant for 6 lectures

Upon request I will gladly make existing evaluations available.

### **Student theses supervision (Hamburg).**

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- ongoing Ilaria Flandoli (PhD)  
*Nichols algebras and logarithmic conformal field theories*
- ongoing 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 Prof. 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).**

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- 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*
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- 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

### **Conferences as main organizer.**

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- 26.8.2019 - 30.8.2019 Summerschool, University of Hamburg  
*Summerschool: Algebraic Structures in Quantum Field Theory*
- 12.8.2019 - 16.8.2019 Workshop, FU Berlin  
*Path integrals and their applications*
- 17.8.2020 - 21.8.2020 Conference, University of Hamburg  
*Conference of the Humboldt Institute Partnership.*

## Conference Talks.

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- 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 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, Rauischholzhausen/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*

## RESEARCH STAYS ABROAD

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- 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)