Curriculum Vitæ: Nils Carqueville

2020–	University of Vienna, Department of Physics
2014–2019	University of Vienna, Department of Mathematics
2013–2014	Simons Center for Geometry and Physics, Stony Brook
2012	Hausdorff Research Institute for Mathematics, Bonn
2009–2012	LMU München & Excellence Cluster Universe
2006–2009	PhD in mathematical physics, King's College London
2000–2006	studies of physics and philosophy at University of Bonn

Publications:

[36] *Topological defects*, with M. Del Zotto and I. Runkel, arXiv:2311.02449 [math-ph]

[35] *Orbifolds of topological quantum field theories*,
Encyclopedia of Mathematical Physics 2nd edition, arXiv:2307.16674 [math-ph]

[34] *Orbifold completion of 3-categories*, with L. Müller, arXiv:2307.06485 [math.QA]

[33] *Truncated affine Rozansky–Witten models as extended defect TQFTs*,
with I. Brunner, Pantelis Fragkos, and D. Roggenkamp, arXiv:2307.06284 [math-ph]

[32] *Invariants of r-spin TQFTs and non-semisimplicity*, with E. Meir and L. Szegedy,
arXiv:2306.08608 [math.QA]

[31] *Looking for structure in the cobordism conjecture*, with D. Andriot and
N. Cribiori, SciPost Phys. **13**, 071 (2022), arXiv:2204.00021 [hep-th]

[30] *Truncated affine Rozansky–Witten models as extended TQFTs*, with I. Brunner and
D. Roggenkamp, Comm. Math. Phys. (2023), arXiv:2201.03284 [math-ph]

[29] *Reshetikhin–Turaev TQFTs close under generalised orbifolds*, with V. Mulevičius,
I. Runkel, G. Schaumann, and D. Scherl, arXiv:2109.04754 [math.QA]

[28] *Fully extended r-spin TQFTs*, with L. Szegedy,
Quantum Topolology **14**:3 (2023), 467–532, arXiv:2107.02046 [math.QA]

[27] *Orbifold graph TQFTs*, with V. Mulevičius, I. Runkel, G. Schaumann, and
D. Scherl, arXiv:2101.02482 [math.QA]

[26] *Extending Landau-Ginzburg models to the point*, with F. Montiel Montoya,
Comm. Math. Phys. **339**:3 (2020), 955–977, arXiv:1809.10965 [math.QA]

[25] *Orbifolds of Reshetikhin-Turaev TQFTs*, with I. Runkel and G. Schaumann,
TAC **35** (2020), 513–561, arXiv:1809.01483 [math.QA]

[24] *Line and surface defects in Reshetikhin-Turaev TQFT*, with I. Runkel and G. Schaumann, Quantum Topology **10**:3 (2019), 399–439, arXiv:1710.10214 [math.QA]

[23] *Orbifolds of n-dimensional defect TQFTs*, with I. Runkel and G. Schaumann,
Geometry & Topology **23** (2019), 781–864, arXiv:1705.06085 [math.QA]

[22] *Introductory lectures on topological quantum field theory*, with I. Runkel,
Banach Center Publications **114** (2018), 9–47, arXiv:1705.05734 [math.QA]

[21] *Lecture notes on 2-dimensional defect TQFT*,
Banach Center Publications **114** (2018), 49–84, arXiv:1607.05747 [math.QA]

[20] *3-dimensional defect TQFTs and their tricategories*, with C. Meusburger and
G. Schaumann, Adv. Math. **364** (2020), 107024, arXiv:1603.01171 [math.QA]

[19] *Calabi-Yau completions and orbifold equivalence*, with A. Quintero Vélez,
arXiv:1509.00880 [math.RT]

[18] *Discrete torsion defects*, with I. Brunner and D. Plencner,
Comm. Math. Phys. **337** (2015), 429–453, arXiv:1404.7497 [hep-th]

[17] *Orbifold equivalent potentials*, with A. Ros Camacho and I. Runkel,
J. of Pure and Applied Algebra **220** (2016), 759–781, arXiv:1311.3354 [math.QA]

[16] *A quick guide to defect orbifolds*, with I. Brunner and D. Plencner,
Proc. of Symp. in Pure Math. **88** (2014), 231–241, arXiv:1310.0062 [hep-th]

[15] *Orbifolds and topological defects*, with I. Brunner and D. Plencner,
Comm. Math. Phys. **332** (2014), 669–712, arXiv:1307.3141 [hep-th]

[14] *A toolkit for defect computations in Landau-Ginzburg models*, with D. Murfet,
Proc. of Symp. in Pure Math. **90** (2015), arXiv:1303.1389 [hep-th]

[13] *Orbifold completion of defect bicategories*, with I. Runkel,
Quantum Topology **7**:2 (2016), 203–279, arXiv:1210.6363 [math.QA]

[12] *Adjunctions and defects in Landau-Ginzburg models*, with D. Murfet,
Adv. Math. **289** (2016), 480–566, arXiv:1208.1481 [math.AG]

[11] *Algorithmic deformation of matrix factorisations*, with L. Dowdy and A. Recknagel,
JHEP **04** (2012) 014, arXiv:1112.3352 [hep-th]

[10] *An invitation to algebraic topological string theory*, with M. M. Kay,
Proc. of Symp. in Pure Math. **85** (2012), 323–332, arXiv:1111.1749 [hep-th]

[9] *Computing Khovanov-Rozansky homology and defect fusion*, with D. Murfet,
Algebraic & Geometric Topology **14** (2014), 489–537, arXiv:1108.1081 [math.QA]

[8] *Bulk deformations of open topological string theory*, with M. M. Kay,
Comm. Math. Phys. **315** (2012), 739–769, arXiv:1104.5438 [hep-th]

[7] *Rigidity and defect actions in Landau-Ginzburg models*, with I. Runkel,
Comm. Math. Phys. **310** (2012), 135–179, arXiv:1006.5609 [hep-th]

[6] *Remarks on quiver gauge theories from open topological string theory*,
with A. Quintero Vélez, JHEP **03** (2010) 129, arXiv:0912.4699 [hep-th]

[5] *On the monoidal structure of matrix bi-factorisations*, with I. Runkel,
J. Phys. A: Math. Theor. **43** (2010) 275401, arXiv:0909.4381 [math-ph]

[4] *Matrix factorisations and open topological string theory*,
JHEP **07** (2009) 005, arXiv:0904.0862 [hep-th]

[3] *Triangle-generation in topological D-brane categories*, JHEP **04** (2008) 031,
arXiv:0802.1624 [hep-th]

[2] *Towards logarithmic mode algebras*, Czech. J. Phys. **56**:10 (2006), 1105–1110

[1] *Nonmeromorphic operator product expansion and C_2-cofiniteness for a family
of $\mathcal{W}$-algebras*, with M. Flohr, J. Phys. A: Math. Gen. **39** (2006), 951–966,
arXiv:math-ph/0508015

Fellowships and grants:

2024–2028	FWF stand-alone grant (one 4-year postdoc and one 3-year PhD position)
2020–2025	Heisenberg Fellowship
2016	Peters-Beer grant (for one postdoc position)
2015	FWF stand-alone grant (for one postdoc and two PhD positions)
2012	3-months fellowship at Hausdorff Research Institute for Mathematics, Bonn
2011	SFB Fellowship (Collaborative Research Center SFB 676, Hamburg)
2010	Kähler Research Fellowship (University of Hamburg)

Workshops co-organised:

07/2024	München–Wien–Würzburg Workshop on Functorial Field Theories, TU München (with G. Schaumann and C. Scheimbauer)
06/2022	Erlangen–Wien–Würzburg Workshop on Functorial Field Theories, Würzburg (with C. Meusburger and G. Schaumann)
01/2019	*Categorification in quantum topology and beyond*, ESI, Wien (with A. Mellit and P. Wedrich)
08/2016	*Topological quantum computation*, Styria
12/2015	*Advanced school on Topological Quantum Field Theory*, Warszawa (with P. Sułkowski and R. Suszek)
10/2015	*Higher TQFT and categorical quantum mechanics*, ESI, Wien (with D. Murfet and I. Runkel)
11/2012	*Algebra, geometry and physics of BPS states*, Hausdorff Center Bonn (with S. Meinhardt and J. Stoppa)

02–03/2012   *New perspectives on susy gauge theories*, München (with I. Brunner)

Seminars and lecture series co-organised:

2020–   Online seminar on theoretical and mathematical physics
           with I. Brunner, H. Jockers, P. Mayr, I. Sachs, and J. Walcher
2020–2024   Online seminar "Higher Structures & Field Theory"
           with C. Meusburger, G. Schaumann, and C. Scheimbauer
07/2022   Lecture series The geometric cobordism hypothesis by Daniel Grady and Dmitri Pavlov (with D. Fiorenza and K. Waldorf)
11/2020   Lecture series Towards a derived Topological Field Theory by Simon Lentner
12/2018   Lecture series Simplicial methods for higher categories: Segal-type models of weak n-categories by Simona Paoli

Referee for:

Advances in Mathematics
Communications in Mathematical Physics
Journal of High Energy Physics
Journal of Pure and Applied Algebra
Journal of Physics A: Mathematical and Theoretical
SciPost Physics

Editor for:

Banach Centre Publications Lecture Series, Polish Academy of Sciences

Supervision:

currently   2 PhD students:
         ○ Aleksandar Ivanov
         ○ Tim Lüders
       2 Master students:
         ○ Christopher Lieberum
         ○ Konrad Martinek
previously   3 PhD projects:
         ○ Diagrams for Tricategories, Daniel Scherl (2019)
         ○ *Extended Landau-Ginzburg models*, Flavio Montiel Montoya (2018)
         ○ *A generators and relations derivation of Khovanov homology of 2-strand braid links*, Omid Hurson (co-supervised with Domenico Fiorenza, 2019)
       6 Master projects:
         ○ *2-Dimensional Extended TQFTs and the Cobordism Hypothesis*, Ekin Kaan (2024)
         ○ *Smooth Functorial Field Theory and the Geometric Cobordism Hypothesis*, Alexander Zahrer (2023)
         ○ *Condensation monads in low dimension*, Moriz Frauenberger (2022)
         ○ *TQFTs with additional structure* (Alfred Wehrl Award), Aaron Hofer (2022)
         ○ *Permutation actions on modular tensor categories*, Albert Georg Passegger (2018)
         ○ *Group representations in tricategories*, Daniel Scherl (2016)
       5 Bachelor projects
2009–2014   co-supervision of 2 PhD, 2 Master and 1 Bachelor projects in Ilka Brunner's group at LMU Munich

Teaching:

summer 2024	lecture course *Topological quantum field theory*
11–12/2023	lecture course *TQFTs, state sum models, and string net models*, Tübingen
winter 2023/24	course *From the science of climate change to the human climate crisis*, with Aiko Voigt, Christa Schleper, and Patrick Scherhaufer
winter 2023/24	*Lab-Course: Theoretical Physics* (constraints in symplectic mechanics)
summer 2023	lecture course *Topological quantum field theory 2*
winter 2022/23	lecture course *Topological quantum field theory*
summer 2022	seminar *3-dimensional functorial field theories* (with Lóránt Szegedy)
winter 2021/22	lecture course *Topological quantum field theory 3*
summer 2021	lecture course *Topological quantum field theory 2*
winter 2020/21	lecture course *Topological quantum field theory*
02/2019	lecture course *Algebraic and categorical structures in (T)QFT*, ESI
winter 2018/19	lecture course *Introduction to category theory 1.5*
winter 2018/19	tutorial *Introduction to category theory 1.5*
winter 2018/19	seminar *"Bachelorseminar"*
05–06/2018	lecture course *Higher structures in TQFT*, SISSA, Italy
summer 2018	lecture course *Representations of algebraic structures*
summer 2018	seminar *Classical physics and symplectic geometry*
summer 2018	seminar *Rozansky–Witten theory*
winter 2017/18	lecture course *Linear algebra 3*
winter 2017/18	tutorial *Linear algebra 3*
winter 2017/18	seminar *Topological phases of matter and TQFT*
winter 2017/18	seminar *Higher categories in topology and physics*
summer 2017	lecture course *Linear algebra 2*
summer 2017	tutorial *Linear algebra 2*
summer 2017	seminar *Factorisation algebras and tensor categories*
winter 2016/17	lecture course *Linear algebra*
winter 2016/17	tutorial *Linear algebra*
winter 2016/17	seminar *From classical physics to factorisation algebras*
summer 2016	lecture course *Topological Quantum Field Theory 2*
summer 2016	tutorial *Linear algebra 2*
winter 2015/16	lecture course *Topological Quantum Field Theory*
winter 2015/16	seminar *Cryptography*
winter 2015/16	seminar *Higher category theory*
winter 2015/16	tutorial *Linear algebra*
summer 2015	lecture course *Introduction to Category Theory*
summer 2015	seminar *"Bachelorseminar"*
winter 2014/15	lecture course *Introduction to Conformal Field Theory*
winter 2014/15	seminar *Infinite-dimensional Lie Algebras*
summer 2014	lecture course *Introduction to Topological Quantum Field Theory*
summer 2014	seminar *Topological Quantum Field Theory*
11/2012	IMPRS lecture course at Max Planck Institute, Golm
04/2012	lecture course at graduate school, University of Hamburg
winter 2009/10	seminar on *conformal field theory*, physical aspects
summer 2006	seminar on *conformal field theory*, mathematical aspects
04/2003–04/2009	tutorials for 19 different lecture courses

Talks at conferences:

09/2023	Algebra, Geometry and Physics, ÖMG Meeting in Graz
08/2023	Categorical aspects of symmetries, Stockholm
08/2023	Higher Structures in Functorial Field Theory, Regensburg

07/2023	Emergent Geometries from Strings and Quantum Fields, GGI Florence
07/2023	Quantum Chern–Simons theory, 29th Nordic Congress of Mathematicians (online)
03/2023	Geometric/Topological Quantum Field Theories and Cobordisms 2023 (online)
10/2022	Category Theory Octoberfest 2022 (online)
08/2022	Higher Structures and Field Theory, ESI, Vienna
08/2021	International Congress on Mathematical Physics (online)
06/2021	Categorical braid group actions and categorical representation theory (online)
12/2020	Mathematical Physics Days 2020 (online)
08/2020	Higher Structures and Field Theory, ESI, Vienna
02/2020	Higher Spin Gauge Theories, TFT and Deformation Quantization, Brussels
06/2019	Defects in topological and conformal field theory, King's College London
02/2019	Young Researchers Integrability School and Workshop, ESI, Wien
07/2018	Geometry and Strings, Ringberg Castle, Tegernsee
09/2017	String Field Theory of Landau-Ginzburg models, Pohang (via live video link)
07/2017	Higher Structures, Lisboa
07/2016	Classical and quantum symmetries in mathematics and physics, Jena
05/2016	Categorification, Bonn
02/2014	Modern trends in topological quantum field theory, ESI, Wien
09/2013	Matrix Factorizations in Algebra, Geometry, and Physics, Oberwolfach
06/2013	String-Math 2013, Stony Brook
05/2013	The Geometry of Topological D-Branes, Categories, and Applications, Wien
03/2013	Mathematical Sciences Research Institute, Berkeley
09/2012	String Theory and Arithmetic Geometry, Bristol
08/2012	New Perspectives in Topological Field Theories, Hamburg
07/2012	String-Math 2012, Bonn
06/2011	String-Math 2011, Philadelphia
12/2011	Noncommutative algebraic geometry and D-branes, Simons Center
05/2011	Workshop on Matrix Factorizations, Bielefeld
03/2011	DFG Darstellungstheorie Schwerpunkttagung, Münster
06/2010	Mini workshop on matrix factorisations, Hannover
06/2010	D-branes, Effective Actions and Homological Mirror Symmetry, Wien
12/2009	Algebraic and Topological Aspects of D-branes, Würzburg
04/2009	Integrable models, CFT and related topics, Oxford
05/2008	Matrix Factorizations in Physics and Mathematics, Banff
04/2008	Integrable models, CFT and related topics, Edinburgh
06/2006	Integrable Systems and Quantum Symmetries, Praha
12/2005	Foundations and Constructive Aspects of QFT, Göttingen

Talks at seminars:

07/2024	LMU München
06/2024	University of Graz
06/2024	Topological Quantum Field Theory Club, Instituto Superior Técnico, Lisbon (online)
12/2023	Max Planck Institute for Mathematics in the Sciences, Leipzig
12/2022	Quantum Topology and Categorification, University of Hamburg
11/2022	Geometry & Topology Seminar, Vienna
06/2022	University of Hamburg (online)
06/2022	Max Planck Institute for Mathematics, Bonn (online)
11/2021	University of Cardiff (online)
03/2021	University of Nottingham (online)
03/2021	Kavli Institute for the Physics and Mathematics of the Universe, Kashiwa (online)
06/2020	**Colloquium** at the Center for Mathematical Physics, Hamburg (online)
06/2020	University of Leeds (online)

05/2020	Heidelberg-München-Wien online seminar on mathematical physics
02/2020	University of Melbourne (online)
03/2019	University of Vienna
12/2018	LMU München
11/2018	University of Paderborn
09/2018	University of Erlangen
05/2018	SISSA, Trieste
03/2018	University of Edinburgh
03/2018	**Colloquium** at University of Leicester
11/2017	La Sapienza, Roma
10/2017	University of Zürich
07/2017	École normale supérieure, Paris
07/2017	Geometry and Physics, IFIN-HH, Bucureşti
07/2017	University of Erlangen
06/2017	Queen Mary, University of London
03/2017	University of Lancaster
01/2017	Technische Universität Wien
12/2016	Heriot-Watt University, Edinburgh
12/2016	Institute of Science and Technology Austria
10/2016	**Colloquium** at University of Luxembourg
10/2016	University of Luxembourg
09/2016	LMU München
07/2016	Max Planck Institute for Mathematics, Bonn
06/2016	Hamburg university
05/2016	Centre for Quantum Geometry of Moduli Spaces, Aarhus
05/2016	**Colloquium** at University of Aarhus
02/2016	University of Lancaster
02/2016	King's College London
08/2015	University of Münster
04/2015	CUNY Representation Theory Seminar, New York
03/2015	**Colloquium** at University of Vienna
01/2015	Centre for Quantum Geometry of Moduli Spaces, Aarhus
12/2014	Max Planck Institute for Mathematics, Bonn
12/2014	**Colloquium** at University of Warszawa
12/2014	Seminar at University of Warszawa
11/2014	University of Graz
03/2014	Technical University of Vienna
03/2014	University of Vienna ($\times 2$)
12/2013	Texas A&M University, College Station
11/2013	McGill University, Montreal
09/2013	Erwin Schrödinger Institute, Wien
07/2013	IBS Center for Geometry and Physics, Pohang
07/2013	Kavli Institute for the Physics and Mathematics of the Universe, Kashiwa
06/2013	Bonn university
05/2013	Heidelberg university
05/2013	Harvard university, Cambridge
04/2013	Duke university, Durham
03/2013	Center for Theoretical Physics, Berkeley
03/2013	University of Pennsylvania, Philadelphia
12/2012	École normale supérieure, Paris
11/2012	Hausdorff Research Institute for Mathematics, Bonn
11/2012	Max Planck Institute for Gravitational Physics, Golm

06/2012	Queen Mary College London
05/2012	Heriot-Watt University, Edinburgh
05/2012	University of Erlangen
04/2012	Hamburg university
11/2011	UCLA
11/2011	Caltech, Pasadena
10/2011	King's College London
06/2011	Münster university
06/2011	Seminar at UCLA
06/2011	**Colloquium** at UCLA
05/2011	Berkeley Center for Theoretical Physics, UC Berkeley
03/2011	Nánjīng university
02/2011	Utrecht university
11/2010	Hamburg university
11/2010	Bonn university
04/2010	**Colloquium** at the Center for Mathematical Physics, Hamburg
04/2010	CERN, Genève
03/2010	King's College London
03/2010	Durham university
02/2010	Augsburg university
01/2010	Fields and Strings Seminar, München
04/2009	Bonn university
02/2009	Utrecht university
12/2008	DESY, Hamburg
11/2008	Arnold Sommerfeld Center, München
09/2008	Max Planck Institute for Gravitational Physics, Golm
05/2008	String theory seminar, Bonn
04/2007	Bonn university
02/2006	Max Planck Institute for Mathematics, Bonn