

Curriculum Vitae

Name: Philippe Roger Corboz
Nationality: Swiss
Place of origin: Oron (VD) and Maracon (VD), Switzerland
Date of birth: February 5, 1978
Address: Institute for Theoretical Physics
University of Amsterdam
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Languages: German, English, French, Dutch



Professional career

- 05/18 – now Associate Professor (tenured) in Computational Condensed Matter Physics, Institute for Theoretical Physics, University of Amsterdam
- 05/14 – 04/18 Assistant Professor in Computational Condensed Matter Physics, Institute for Theoretical Physics, University of Amsterdam
- 10/11 – 04/14 Lecturer and Swiss National Science Foundation (SNSF) Ambizione Research Fellow, Institute for Theoretical Physics, ETH Zurich
- 10/10 – 09/11 MaNEP mobile Post-Doc, Institute for Theoretical Physics at EPFL and ETH Zurich
- 10/08 – 09/10 Post-Doctoral Research Fellow in the group of Prof. G. Vidal, University of Queensland, Brisbane, Australia
- 01/05 – 09/08 Research Assistant in the group of Prof. M. Troyer, Institute for Theoretical Physics, ETH Zurich
- 05/01 – 07/01 Internship in Informatics at the ABB Research Center, Dättwil, Switzerland. Development of .NET web-applications with access to databases
- 09/00 – 12/00 Internship in Theoretical Physics at the ABB Research Center, Dättwil, Switzerland. Calculation of AC-losses in circular superconductors

Education and career development

- 01/17 – 05/18 Programme “Personal Leadership in an academic context” at the UvA
- 09/15 – 06/16 Didactic program “Basiskwalificatie Onderwijs (BKO)” at the UvA
- 01/05 – 09/08 Ph.D. at the Institute for Theoretical Physics, ETH Zurich, with Prof. M. Troyer
- 11/04 Graduation in Theoretical Physics *with distinction* at ETH (Master degree)
- 04/04 – 08/04 Diploma Thesis at the Condensed Matter Theory Institute (J. Lidmar), KTH, Stockholm
- 10/01 – 08/04 Studies in Theoretical Physics at ETH Zurich
- 10/98 – 08/00 Undergraduate studies in Physics at EPFL, Switzerland

Awards and fellowships

- 10/14 Visiting Fellowship at Perimeter Institute for Theoretical Physics, Waterloo, Canada
- 08/11 Swiss National Science Foundation Ambizione Fellowship (research grant for three years)
- 11/04 ETH Pólya Prize for highest grades in final exams (Master degree)

Grants

- 12/21 IoP funding for a 2-year postdoc position for Wout Merbis, together with Clélia de Mulatier. “Quantum methods for stochastic processes: applying tensor networks to complex systems”
- 03/21 500k core hours on the national Cartesius computing cluster
- 11/20 ERC consolidator grant NexGenTeN, “State-of-the-art simulations of quantum many-body systems with the next-generation tensor network algorithms”, EUR 2’000k for 5 years
- 11/19 Delta ITP grant for a 2-year postdoc position for the project “Realizing the Sachdev-Ye-Kitaev model in strained iridates” together with L. Fritz (UU)
- 12/18 IoP funding for a PhD student shared with the experimental group of Dr. R. Gerritsma (UvA) for the project “A two-dimensional trapped ion quantum simulator”
- 07/16 PhD grant from the Delta ITP Diversity program together with L. Fritz (UU) and D. Schuricht (UU)
- 11/15 ERC starting grant TENSORNETSIM, “Accurate simulations of strongly correlated systems with tensor network methods”, EUR 1’500k for 5 years
- 12/12 FOR1807 DFG Research Unit “Advanced Computational Methods for Strongly Correlated Quantum Systems”.
Total EUR 1’500k for 3 years for 8 subprojects located in Germany, Switzerland and Austria, funded by the DFG, SNSF and FWF.
Principal investigator, together with F. Assaad, R. Noack, F. Heidrich-Meisner, M. Hohenadler, A. Honecker, E. Jeckelmann, A. Läuchli, T. Pruschke, U. Schollwöck, M. Troyer, S. Wessel
- 11/12 CHF 14.4k for workshop on “Tensor network algorithms in computational physics and numerical analysis” in May 2013, funded by CECAM
- 04/12 CHF 20k for workshop on “Tensor network algorithms in computational physics and numerical analysis” in May 2013, funded by the Pauli Center for Theoretical Physics
- 08/11 Swiss National Science Foundation (SNSF) Ambizione grant (PZ00P2_136863)
CHF 385k for 3 years, principal investigator

Memberships and collaboration networks

- Member of the European Tensor Network (<http://quantumtensor.pks.mpg.de/>)
- Member of the Delta Institute for Theoretical Physics in the Netherlands
- Associate member of the Fugaku project on “*Basic science for emergence and functionality of quantum matter*” led by Prof. Masatoshi Imada (Waseda University, Japan)
- Affiliated member of QuSoft (Dutch research center for quantum software)
- Affiliated member of the Simons Collaboration of the Many-Electron Problem
- Former member of the DFG FOR1807 research unit
- Former contributor to the ALPS project (alps.comp-phys.org)

Event organization

- 01/22 – 07/22 Member of the programme committee of the SCES 2022 conference
- 01/20 Member of the programme committee of the Veldhoven meeting 2020
- 09/14 – 02/20 Organizer of the weekly Condensed Matter Theory seminar at the UvA
- 07/19 Organizer of the “Amsterdam Summer Workshop on low-D Quantum Condensed Matter 2019”, University of Amsterdam
- 03/19 Co-organizer of the focus topic "Frustrated magnetism" at the 2019 APS March Meeting
- 07/15 Organizer of the “Amsterdam Summer Workshop on low-D Quantum Condensed Matter 2015”, University of Amsterdam
- 05/13 Organizer of the international workshop on “Tensor network algorithms in computational physics and numerical analysis” at ETH
- 09/06 Co-organizer of international workshop “Monte Carlo data formats” at ETH

Member of committees and other roles

- 09/23 – now HPC commission at the Faculty of Science, UvA
- 09/21 – now Editorial Fellow of SciPost Physics
- 10/20 – now ICT for Research Committee (IOC) at the UvA
- 04/21 – 05/21 ICT strategy FNWI workgroup at the UvA
- 03/21 – 07/21 Appointment committee for a IoP-ARCNL tenure-track position in “Theory & Modeling of Materials for Nanolithography”
- 10/20 – 06/21 Appointment committee for a tenure-track position theoretical quantum condensed matter physics
- 10/19 – 05/20 Appointment committee for two tenure-track positions in experimental and theoretical quantum condensed matter physics
- 09/16 – 10/18 Jury member of the *Pieter Zeeman price* for the best Master thesis in Physics

Member of PhD defense committees

- 07/23 Bart de Klerk (University of Amsterdam)
- 05/22 Jans Henke (University of Amsterdam)
- 02/22 Daniel Chernowitz (University of Amsterdam)
- 01/22 Jurriaan Wouters (University of Utrecht)
- 09/21 Yuan Miao (University of Amsterdam)
- 06/21 Joris Kattemölle (University of Amsterdam / QuSoft)
- 03/21 Norman Ewald (University of Amsterdam)
- 07/20 Alexandre Foley (Université de Sherbrooke)
- 10/19 Juraj Hasik (SISSA, Trieste, Italy)
- 09/19 Olivier Gauthé (Université de Paul Sabatier, Toulouse, France)
- 06/19 Benedikt Schönauer (University of Utrecht)
- 08/17 Juan Camillo Osorio Iregui (ETH Zurich)
- 02/17 Arthur La Rooij (University of Amsterdam)

11/16 Laurens Vanderstraeten (University of Ghent)
10/16 Rianne van den Berg (University of Amsterdam)
10/15 Bram Wouters (University of Amsterdam)
09/13 Wenjun Hu (SISSA, Trieste, Italy)

Refereeing for journals

- Nature, NPJ Quantum Materials, Nature Physics Communications
- Science
- Physical Review Letters, Physical Review X, Physical Review X Quantum
- Physical Review B, Physical Review Research
- Europhysics Letters, European Physical Journal B
- New Journal of Physics
- Journal of Statistical Physics, Journal of Physics: Condensed Matter
- SciPost Physics

Refereeing for funding agencies

- Research Foundation Flanders (FWO)
- Deutsche Forschungsgemeinschaft (DFG)
- European Research Council (ERC)
- Department of Energy Office of Science (DOE Office of Science, U.S.)

Teaching

06/23 Master course on “Advanced Computational Condensed Matter”, UvA
06/23 Bachelor course on “Numerical Statistical Physics”, UvA
06/22 Master course on “Advanced Computational Condensed Matter”, UvA
06/22 Bachelor course on “Numerical Statistical Physics”, UvA
04/22 – 05/22 Master course on “Advanced numerical methods in many-body physics”, UvA
06/21 Master course on “Advanced Computational Condensed Matter”, UvA
06/21 Bachelor course on “Numerical Statistical Physics”, UvA
04/21 – 05/21 Master course on “Advanced numerical methods in many-body physics”, UvA
04/20 – 05/20 Master course on “Advanced numerical methods in many-body physics”, UvA
06/20 Master course on “Advanced Computational Condensed Matter”, UvA
04/20 – 05/20 Master course on “Advanced numerical methods in many-body physics”, UvA
02/20 Invited lectures on “Introduction to iPEPS”, Benasque, Spain
06/19 Master course on “Advanced Computational Condensed Matter”, UvA
04/19 – 05/19 Master course on “Advanced numerical methods in many-body physics”, UvA
11/18 Invited lectures on “Introduction to iPEPS and MERA”, at the International school “Tensor product state simulations of strongly correlated systems”, MPIPKS, Dresden, Germany
06/18 Master course on “Advanced Computational Condensed Matter”, UvA
04/18 – 05/18 Master course on “Advanced numerical methods in many-body physics”, UvA

- 03/18 Lectures on “Introduction to tensor networks for quantum many-body systems” (3 days) at the DRSTP PhD school, Dalfsen, Netherlands.
- 09/17 Invited lecture on “Projected entangled-pair states (PEPS)” at the 2017 Arnold Sommerfeld School on “Numerical methods for correlated many-body systems”, Munich.
- 04/17 – 05/17 Delta ITP Advanced topics in Theoretical Physics course on “Tensor Networks”, Leiden.
- 02/17 – 04/17 Master course on “Advanced numerical methods in many-body physics”, UvA
- 11/16 Invited lectures on “Projected entangled-pair states” at the International school “Tensor product state simulations of strongly correlated systems”, MPIPKS, Dresden, Germany
- 07/16 Invited lectures on “Infinite projected entangled-pair states” at ISSP, Japan
- 06/16 Invited lectures on “MERA”, “PEPS”, and “Advanced Tensor Network Applications” at the Simons Center, Stony Brook, USA
- 02/16 – 04/16 Master course on “Advanced numerical methods in many-body physics”, UvA
- 06/15 Invited lectures on “PEPS Algorithms and Implementations” at the international “Tensor Network Summer School” in Ghent, Belgium
- 02/15 – 04/15 Master course on “Advanced numerical methods in many-body physics”, UvA
- 09/13 Invited lectures “Introduction to tensor network algorithms” given at the fall school on “Advanced algorithms for correlated quantum matter”, Würzburg, Germany
- 06/12 Invited lectures on “PEPS” and “Fermionic tensor networks” held at the international summer school on “new trends in computational approaches for many-body systems”, Sherbrooke, Canada
- 02/11 – 12/13 Organization, supervision, and chairing of the “CSE (Computational Science and Engineering) seminar in Theoretical Physics”
- 02/11 – 07/11 Teaching assistant in “Numerical Physics” at EPFL
- 01/05 – 12/07 Teaching assistant in “Computational Physics”, “Programming Techniques” (C++), and “Quantum Mechanics” classes
- 08/02 – 02/07 High-school teacher (substitute) in physics and mathematics at the Kantonsschule Wohlen (AG), Switzerland (approx. 200 lessons in total)
- 10/01 – 07/02 Teaching assistant in “Numerics” and “Linear Algebra” at the Math Department, ETH

Supervision and group members

Postdocs

- 04/22 – now Wout Merbis (together with Clélia de Mulatier)
- 12/21 – 11/23 Boris Ponsioen
- 11/21 – 03/24 Juraj Hasik
- 05/20 – 08/23 Matthias Peschke
- 01/19 – 12/20 Natalia Chepiga
- 09/16 – 08/19 Sangwoo Chung
- 10/16 – 03/17 Piotr Czarnik (long term visiting postdoc)

PhD students

- 06/23 – now Stijn Kleijweg
- 10/22 – now Yining Zhang

- 09/19 – 10/23 Juan Diego Arias Espinoza (together with R. Gerritsma)
- 10/18 – 03/23 Patrick Vlaar, "Tensor Network Algorithms for Three-Dimensional Quantum Systems"
- 09/17 – 11/21 Boris Ponsioen, "Lighting up the network - Ground states and excitations of strongly correlated systems with two-dimensional tensor networks"
- 10/16 – 11/20 Schelto Crone, "Studying topological order and Ising criticality with tensor network algorithms"
- 07/14 – 07/18 Ido A. Niesen, "Exotic Phases of Matter in Quantum Magnets - A Tensor Networks Tale"
- 06/12 – 08/17 Juan C. Osorio Iregui, "Connecting the Dots tensor network algorithms for two-dimensional strongly-correlated systems", ETH Zurich

Master projects

- 09/23 – now Nick Giovanoudis, "Contraction of 2D tensor networks with periodic boundary conditions"
- 09/22 – now Oscar van Alphen, "Automatic differentiation and contraction of infinite projected entangled-pair states"
- 09/21 – 08/22 Marco Bout, "Tensor network simulations of 2D quantum many-body systems based on a cluster optimization"
- 09/19 – 08/20 K. W. Torre, "Thermodynamics of the Shastry-Sutherland model using tensor networks"
- 09/19 – 08/20 S. Kleijweg, "Automatic Differentiation and Tensor Networks"
- 09/18 – 08/20 R. Timmermanns, "Tree tensor network ansatz in 1D & 2D"
- 09/18 – 08/19 M. Tepaske, "Neuronal Network Quantum States"
- 09/17 – 08/18 R. v. d. Werff, "Simulating classical spin systems using the Fixed Point Corner Method"
- 09/17 – 07/18 P. Vlaar, "3D tensor network simulations using simple update optimization"
- 09/16 – 02/18 K. Temmink, "On tensor network methods for one-dimensional open quantum systems"
- 07/16 – 08/17 B. Ponsioen, "Combining Variational Optimization with Entanglement Renormalization in a Tensor Network framework"
- 07/16 – 08/17 G. Kapteijns, "Finite bond dimension scaling with the corner transfer matrix renormalization group method"
- 09/15 – 08/16 L. Schoonderwoerd, "DMRG with local unitary transformations"
- 09/15 – 08/16 S. Crone, "Tensor network renormalization"
- 10/14 – 10/15 E. van Walsem, "Quantum Monte Carlo simulations of bosons in 2D lattices", *joint project with the experimental group of dr. R. Spreeuw (UvA)*
- 03/12 – 08/12 M. Obrecht, "Simulation of one dimensional quantum systems at finite temperature with minimally entangled typical thermal states" (ETH)
- 10/07 – 02/08 P. Sémon, "Pre-projected Gaussian Quantum Monte Carlo for Hubbard ladders" (ETH)

Bachelor projects

- 04/23 – 07/23 D. Niessink, "Tensor network study of the 2D Blume-Capel model"
- 04/18 – 07/18 F. van der Ploeg, "Simulation of the 2D Ising model using the Corner Transfer Matrix Renormalization Group method on the square, honeycomb, and triangular lattice"
- 06/17 – 07/17 F. van der Ploeg, D. van den Bergh, "Simulation of the site-percolation problem on a two-dimensional square lattice" (2nd year project)
- 04/16 – 07/16 R. van der Werff, "Simulating classical spin systems using the CTMRG method"
- 04/16 – 07/16 T. Zwart, "Monte Carlo Simulations of the 3-State Potts Model in 2D"

Publications and Presentations summary

Total publications (69 peer-reviewed papers, 1 book chap., 2 theses, 2 proceedings, 2 preprints)	76
First-author publications	23
Total paper citations ¹	6341
h-index ¹	37
Invited conference talks (64), invited seminars (43), and invited lectures (13)	120
Contributed conference presentations (talks + posters)	24

Publication list

Peer-reviewed articles

- [69] *Superconducting Stripes in the Hole-Doped Three-Band Hubbard Model*,
B. Ponsioen, S. S. Chung, and P. Corboz,
Phys. Rev. B 108, 205154 (2023).
- [68] *Tensor Network Study of the Shastry-Sutherland Model with Weak Interlayer Coupling*,
P. C. G. Vlaar and P. Corboz,
SciPost Physics 15, 126 (2023).
- [67] *Improved summations of n -point correlation functions of projected entangled-pair states*,
B. Ponsioen, J. Hasik, and P. Corboz,
Phys. Rev. B 108, 195111 (2023).
- [66] *Efficient Simulations of Epidemic Models with Tensor Networks: Application to the One-Dimensional Susceptible-Infected-Susceptible Model*,
W. Merbis, C. de Mulatier, and P. Corboz,
Phys. Rev. E 108, 024303 (2023).
- [65] *Unveiling New Quantum Phases in the Shastry-Sutherland Compound $\text{SrCu}_2(\text{BO}_3)_2$ up to the Saturation Magnetic Field*,
T. Nomura, P. Corboz, A. Miyata, S. Zherlitsyn, Y. Ishii, Y. Kohama, Y. H. Matsuda, A. Ikeda, C. Zhong, H. Kageyama, and F. Mila,
Nat. Commun. 14, 1 (2023).
- [64] *Efficient Tensor Network Algorithm for Layered Systems*,
P. C. G. Vlaar and P. Corboz,
Phys. Rev. Lett. 130, 130601 (2023).
- [63] *Competing States in the Two-Dimensional Frustrated Kondo-Necklace Model*,
M. Peschke, B. Ponsioen, and P. Corboz,
Phys. Rev. B 106, 205140 (2022).

¹ Google Scholar in January 2024

- [62] *Variational methods for contracting projected entangled-pair states*,
L. Vanderstraeten, L. Burgelman, B. Ponsioen, M. Van Damme, B. Vanhecke, P. Corboz, J. Haegeman, and F. Verstraete,
Phys. Rev. B 105, 195140 (2022).
- [61] *Discovery of quantum phases in the Shastry-Sutherland compound $SrCu_2(BO_3)_2$ under extreme conditions of field and pressure*,
Z. Shi, S. Dissanayake, P. Corboz, W. Steinhardt, D. Graf, D. M. Silevitch, H. A. Dabkowska, T. F. Rosenbaum, F. Mila, and S. Haravifard,
Nature Communications 13, 1 (2022).
- [60] *Quantum Monte Carlo Simulations in the the Trimer Basis: First-Order Transitions and Thermal Critical Points in Frustrated Trilayer Magnets*,
L. Weber, A. Honecker, B. Normand, P. Corboz, F. Mila, and S. Wessel,
SciPost Physics 12, 054 (2022).
- [59] *Automatic Differentiation Applied to Excitations with Projected Entangled Pair States*,
B. Ponsioen, F. F. Assaad, and P. Corboz,
SciPost Physics 12, 006 (2022).
- [58] *The Hubbard Model: A Computational Perspective*,
M. Qin, T. Schäfer, S. Andergassen, P. Corboz, and E. Gull,
Annual Review of Condensed Matter Physics **13**, 275 (2022).
- [57] *Unsupervised Mapping of Phase Diagrams of 2D Systems from Infinite Projected Entangled-Pair States via Deep Anomaly Detection*,
K. Kottmann, P. Corboz, M. Lewenstein, and A. Acín,
SciPost Physics 11, 025 (2021).
- [56] *Engineering Spin-Spin Interactions with Optical Tweezers in Trapped Ions*,
J. D. A. Espinoza, M. Mazzanti, K. Fouka, R. X. Schüssler, Z. Wu, P. Corboz, R. Gerritsma, and A. S. Naini,
Phys. Rev. A 104, 013302 (2021).
- [55] *Simulation of Three-Dimensional Quantum Systems with Projected Entangled-Pair States*,
P. C. G. Vlaar and P. Corboz,
Phys. Rev. B 103, 205137 (2021).
- [54] *A quantum magnetic analogue to the critical point of water*,
J. L. Jiménez, S. P. G. Crone, E. Fogh, M. E. Zayed, R. Lortz, E. Pomjakushina, K. Conder, A. M. Läuchli, L. Weber, S. Wessel, A. Honecker, B. Normand, C. Rüegg, P. Corboz, H. M. Rønnow, and F. Mila, Nature 592, 370 (2021).
- [53] *Tensor Network Study of the $m=1/2$ Magnetization Plateau in the Shastry-Sutherland Model at Finite Temperature*,
P. Czarnik, M. M. Rams, P. Corboz, and J. Dziarmaga,
Phys. Rev. B 103, 075113 (2021).

- [52] *Excitations with Projected Entangled Pair States using the Corner Transfer Matrix method*,
B. Ponsioen and P. Corboz,
Phys. Rev. B 101, 195109 (2020).
- [51] *Detecting a Z_2 topologically ordered phase from unbiased infinite projected entangled-pair state simulations*,
S. P. G. Crone and P. Corboz,
Phys. Rev. B 101, 115143 (2020).
- [50] *Period 4 stripe in the extended two-dimensional Hubbard model*,
B. Ponsioen, S. S. Chung, and P. Corboz,
Phys. Rev. B 100, 195141 (2019).
- [49] *Competition between intermediate plaquette phases in $\text{SrCu}_2(\text{BO}_3)_2$ under pressure*,
C. Boos, S.P.G. Crone, I.A. Niesen, P. Corboz, K.P. Schmidt, F. Mila
Phys. Rev. B 100, 140413 (2019).
- [48] *Thermodynamic properties of the Shastry-Sutherland model throughout the dimer-product phase*,
A. Wietek, P. Corboz, S. Wessel, B. Normand, F. Mila, and A. Honecker,
Phys. Rev. Research 1, 033038 (2019).
- [47] *$SU(3)$ Fermions on the Honeycomb Lattice at $1/3$ -Filling*,
S. Chung and P. Corboz
Phys. Rev. B 100, 035134 (2019).
- [46] *Finite correlation length scaling with infinite projected entangled pair states at finite temperature*,
P. Czarnik and P. Corboz,
Phys. Rev. B 99, 245107 (2019).
- [45] *Emergent Bound States and Impurity Pairs in Chemically Doped Shastry-Sutherland System*,
Z. Shi, W. Steinhardt, D. Graf, P. Corboz, D. Weickert, N. Harrison, M. Jaime, C. Marjerrison, H.
Dabkowska, F. Mila, and S. Haravifard
Nature Communications 10, 2439 (2019).
- [44] *Time Evolution of an Infinite Projected Entangled Pair State: an Efficient Algorithm*,
P. Czarnik, J. Dziarmaga, and P. Corboz,
Phys. Rev. B. 99, 035115 (2019).
- [43] *Thermodynamic properties of the Shastry-Sutherland model from quantum Monte Carlo simulations*
S. Wessel, I. Niesen, J. Stapmanns, B. Normand, F. Mila, P. Corboz, and A. Honecker,
Phys. Rev. B. 98, 174432 (2018).
- [42] *Thermal Critical Points and Quantum Critical End Point in the Frustrated Bilayer Heisenberg Antiferromagnet*,
J. Stapmanns, P. Corboz, F. Mila, A. Honecker, B. Normand, and S. Wessel,
Phys. Rev. Lett. 121, 127201 (2018).

- [41] *Finite Correlation Length Scaling with Infinite Projected Entangled-Pair States*,
P. Corboz, P. Czarnik, G. Kapteijns, and L. Tagliacozzo,
Phys. Rev. X 8, 031031 (2018).
- [40] *Ground-state study of the spin-1 bilinear-biquadratic Heisenberg model on the triangular lattice using tensor networks*,
I. Niesen and P. Corboz,
Phys. Rev. B 97, 245146 (2018).
- [39] *A tensor network study of the complete ground state phase diagram of the spin-1 bilinear-biquadratic Heisenberg model on the square lattice*,
I. Niesen and P. Corboz,
SciPost Physics 3, 030 (2017).
- [38] *Stripe order in the underdoped region of the two-dimensional Hubbard model*,
B.-X. Zheng, C.-M. Chung, P. Corboz, G. Ehlers, M.-P. Qin, R. M. Noack, H. Shi, S. R. White, S. Zhang, and G. K.-L. Chan,
Science 358, 1155 (2017).
- [37] *Infinite Matrix Product States vs Infinite Projected Entangled-Pair States on the Cylinder: a comparative study*,
J. Osorio Iregui, M. Troyer, and P. Corboz,
Phys. Rev. B 96, 115113 (2017).
- [36] *Emergent Haldane phase in the $S=1$ bilinear-biquadratic Heisenberg model on the square lattice*,
I. Niesen and P. Corboz,
Phys. Rev. B 95, 180404 (2017).
- [35] *Gradient methods for variational optimization of projected entangled-pair states*,
L. Vanderstraeten, J. Haegeman, P. Corboz, and F. Verstraete,
Phys. Rev. B 94, 155123 (2016). *Editors' Suggestion*
- [34] *Variational optimization with infinite projected entangled-pair states*,
P. Corboz,
Phys. Rev. B 94, 35133 (2016). *Editors' Suggestion*
- [33] *Plaquette order in the $SU(6)$ Heisenberg model on the honeycomb lattice*,
P. Nataf, M. Lajkó, P. Corboz, A. M. Läuchli, K. Penc, and F. Mila,
Phys. Rev. B 93, 201113 (2016). *Rapid Communication*
- [32] *Improved energy extrapolation with infinite projected entangled-pair states applied to the 2D Hubbard model*,
P. Corboz,
Phys. Rev. B 93, 045116 (2016)
- [31] *Infinite projected entangled pair states algorithm improved: Fast full update and gauge fixing*,
H. N. Phien, J. A. Bengua, H. D. Tuan, P. Corboz, and R. Orus, Phys.
Rev. B 92, 035142 (2015)

- [30] *Efficient Continuous-time Quantum Monte Carlo Method for the Ground State of Correlated Fermions*,
L. Wang, M. Iazzi, P. Corboz, and M. Troyer,
Phys. Rev. B 91, 235151 (2015). *Editors' Suggestion*
- [29] *Probing the stability of the spin liquid phases in the Kitaev-Heisenberg model using tensor network algorithms*,
J. O. Iregui, P. Corboz, and M. Troyer,
Phys. Rev. B 90, 195102 (2014)
- [28] *Fermionic Quantum Critical Point of Spinless Fermions on a Honeycomb Lattice*,
L. Wang, P. Corboz, and M. Troyer,
New Journal of Physics 16, 103008 (2014)
- [27] *Competing states in the t - J model: uniform d -wave state versus stripe state*,
P. Corboz, T. M. Rice, and M. Troyer, Phys.
Rev. Lett. 113, 046402 (2014).
Recommended in the Journal Club for Condensed Matter Physics by S. Kivelson²
- [26] *Resonating-valence-bond superconductors with fermionic projected entangled pair states*,
D. Poilblanc, P. Corboz, N. Schuch, and J. I. Cirac,
Phys. Rev. B 89, 241106 (2014). *Rapid Communication*
- [25] *Crystals of bound states in the magnetization plateaus of the Shastry-Sutherland model*,
P. Corboz and F. Mila,
Phys. Rev. Lett. 112, 147203 (2014)
- [24] *Magnetization of $\text{SrCu}_2(\text{BO}_3)_2$ in Ultrahigh Magnetic Fields up to 118 T*,
Y. H. Matsuda, N. Abe, S. Takeyama, H. Kageyama, P. Corboz, A. Honecker, S. R. Manmana,
G. R. Foltin, K. P. Schmidt, and F. Mila,
Phys. Rev. Lett. 111, 137204 (2013)
- [23] *Competition between three-sublattice order and superfluidity in the quantum 3-state Potts model of ultracold bosons and fermions on a square optical lattice*,
L. Messio, P. Corboz, and F. Mila,
Phys. Rev. B 88, 155106 (2013)
- [22] *Competing states in the $SU(3)$ Heisenberg model on the honeycomb lattice: Plaquette valence-bond crystal versus dimerized color-ordered state*,
P. Corboz, M. Lajkó, K. Penc, F. Mila, and A. M. Läuchli,
Phys. Rev. B 87, 195113 (2013)
- [21] *Tensor network study of the Shastry-Sutherland model in zero magnetic field*,
P. Corboz and F. Mila,
Phys. Rev. B 87, 115144 (2013)

² see <http://www.condmatjournalclub.org/?p=2367>

- [20] *Phase diagram of ^4He on graphene*,
J. Happacher, P. Corboz, M. Boninsegni, and L. Pollet,
Phys. Rev. B 87, 094514 (2013)
- [19] *Spin-Orbital Quantum Liquid on the Honeycomb Lattice*,
P. Corboz, M. Lajkó, A. M. Läuchli, K. Penc, and F. Mila,
Phys. Rev. X 2, 041013 (2012)
- [18] *Simplex solids in $SU(N)$ Heisenberg models on the kagome and checkerboard lattices*,
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B. Bauer, P. Corboz, A. M. Läuchli, L. Messio, K. Penc, M. Troyer, F. Mila,
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P. Corboz, A. M. Läuchli, K. Penc, M. Troyer, F. Mila,
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Phys. Rev. B 84, 041108 (2011). *Rapid Communication, Editor's Suggestion*
- [13] *Implementing global Abelian symmetries in projected entangled-pair state algorithms*,
B. Bauer, P. Corboz, R. Orus, and M. Troyer,
Phys. Rev. B 83, 125106 (2011)
- [12] *Simulation of fermionic lattice models in two dimensions with projected entangled-pair states: Next-nearest neighbor Hamiltonians*,
P. Corboz, J. Jordan, and G. Vidal, Phys. Rev. B 82, 245119 (2010).
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- [11] *Non-local scaling operators with entanglement renormalization*,
G. Evenbly, P. Corboz, and G. Vidal,
Phys. Rev. B 82, 132411 (2010)
- [10] *Simulation of anyons with tensor network algorithms*,
R. N. C. Pfeifer, P. Corboz, O. Buerschaper, M. Aguado, M. Troyer, and G. Vidal,
Phys. Rev. B 82, 115126 (2010).
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P. Corboz, R. Orús, B. Bauer, and G. Vidal,
Phys. Rev. B 81, 165104 (2010)
- [8] *Simulation of interacting fermions with entanglement renormalization*,
P. Corboz, G. Evenbly, F. Verstraete, and G. Vidal
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P. Corboz and G. Vidal,
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- [6] *Binding of a Helium-3 Impurity to a Screw Dislocation in Solid Helium-4*,
P. Corboz, L. Pollet, N. V. Prokof'ev, and M. Troyer,
Phys. Rev. Lett. 101, 155302 (2008)
- [5] *Phase diagram of Helium-4 adsorbed on graphite*,
P. Corboz, M. Boninsegni, L. Pollet, and M. Troyer,
Phys. Rev. B 78, 245414 (2008)
- [4] *Systematic errors in Gaussian quantum Monte Carlo and a systematic study of the symmetry projection method*,
P. Corboz, A. Kleine, F. F. Assaad, I. P. McCulloch, U. Schollwoeck, and M. Troyer,
Phys. Rev. B 77, 085108 (2008)
- [3] *Spontaneous trimerization in a bilinear-biquadratic $S=1$ zig-zag chain*,
P. Corboz, A. M. Läuchli, K. Totsuka, and H. Tsunetsugu,
Phys. Rev. B 76, 220404(R) (2007). *Rapid Communication*
- [2] *The ALPS project release 1.3: open source software for strongly correlated systems*,
A.F. Albuquerque et al. (ALPS collaboration),
Journal of Magnetism and Magnetic Materials 310, 1187 (2007)
- [1] *Symmetry projection schemes for Gaussian Monte Carlo methods*,
F. F. Assaad, P. Werner, P. Corboz, E. Gull, and M. Troyer,
Phys. Rev. B 72, 22451 (2005)

Book chapters

- [B1] *Phase-Space Methods for Fermions*,
P. Corboz, M. Ögren, K. Kheruntsyan, and J. F. Corney,
in S. Gardiner, N. Proukakis, and M. Davis, *Quantum Gases: Finite Temperature and Non-Equilibrium Dynamics* (Imperial College Press, 2012)

Conference proceedings

- [C2] *Quantum Monte Carlo Simulations of Highly Frustrated Magnets in a Cluster Basis: The Two-Dimensional Shastry-Sutherland Model*,
A. Honecker, L. Weber, P. Corboz, F. Mila, and S. Wessel,
J. Phys.: Conf. Ser. **2207**, 012032 (2022)
- [C1] *Gaussian Quantum Monte Carlo methods with symmetry projection*,
F. F. Assaad, P. Corboz, E. Gull, W. P. Petersen, M. Troyer, and P. Werner,
AIP Conf. Proc. 816, 2 4 (2006)

Theses

- [T2] *Simulations of strongly correlated bosons and fermions (PhD Thesis)*,
P. Corboz,
No 17994, ETH Zurich (2008)
- [T1] *Breakable elastic string driven in random media (Master Thesis)*,
P. Corboz,
Trita-FYS, 0280-316X; 2004:53

Preprints / submitted papers

- [S2] *Itinerant Magnetism in the Triangular Lattice Hubbard Model at Half-Doping: Application to Twisted Transition-Metal Dichalcogenides*,
Y. He, R. Rausch, M. Peschke, C. Karrasch, P. Corboz, N. Bultinck, and S. A. Parameswaran,
arXiv:2311.10146.
- [S1] *Incommensurate Order with Translationally Invariant Projected Entangled-Pair States: Spiral States and Quantum Spin Liquid on the Anisotropic Triangular Lattice*,
J. Hasik and P. Corboz,
arXiv:2311.05534.

Conference presentations

Invited conference talks (64)

- 01/24 4th plenary meeting of the International Quantum Tensor Network, TIC, Glasgow, UK,
“iPEPS for layered systems and incommensurate spin spiral phases”
- 01/24 International conference on “Highly Frustrated Magnetism (HFM2024)”, ITTM Chennai, India,
“Tensor network studies of the Shastry-Sutherland and the anisotropic triangular-lattice

- Heisenberg model”
- 10/23 International workshop on “Tensor networks for constrained systems”, Delft, NL,
“Finite T simulations and excitations with infinite projected entangled-pair states”
 - 08/23 International workshop on “Tensor Network States: Algorithms and Applications (TNSAA) 2023”,
Shanghai, China, “iPEPS beyond 2D ground states: finite temperature, excitations and
extensions to 3D”
 - 06/23 Workshop on “Precision Many Body Physics 2023”, Collège de France, Paris, France,
“Tensor network study of $\text{SrCu}_2(\text{BO}_3)_2$ under pressure and in a magnetic field”
 - 03/23 Workshop “Focus week on tensor networks”, ICMAT, Madrid, Spain,
“iPEPS: ground states, finite temperature, excitations, and extensions to 3D”
 - 11/22 Workshop “Entanglement scaling and Criticality with Tensor Networks”, EPFL, Switzerland,
“Applications of finite correlation length scaling with iPEPS”
 - 11/22 Workshop “Novel Quantum States in Condensed Matter 2022”, Kyoto University, Japan,
“Progress in understanding the quantum phases of $\text{SrCu}_2(\text{BO}_3)_2$ ”
 - 11/22 Workshop “Quantum simulation of doped Hubbard Systems”, ITAMP, Boston, USA,
“Simulations of the 2D Hubbard model with infinite projected entangled-pair states”
 - 09/22 Workshop “Computational aspects of Tensor Networks”, ESI, Vienna, Austria,
“iPEPS for 3D and layered quantum systems”
 - 09/22 ICTS program “Frustrated Metals and Insulators (hybrid)”, Bangalore, India,
“Tensor network studies of $\text{SrCu}_2(\text{BO}_3)_2$ ”
 - 05/22 Delft Many-Body Workshop Series, Netherlands,
“Introduction to tensor networks and applications to 2D strongly correlated systems”
 - 05/22 Asian-European workshop on “SU(N) physics in condensed matter and cold atoms” (online),
“Tensor network study of the SU(3) Hubbard model on the honeycomb lattice at 1/3 filling”
 - 09/21 FOR1807 International Conference 2021: Computational Methods for Quantum Many-Body
Systems: Algorithms, Models and Materials, Goettingen, Germany,
“Tensor network study of $\text{SrCu}_2(\text{BO}_3)_2$ under pressure”
 - 08/21 32nd IUPAP Conference on Computational Physics (CCP2021), Coventry University, UK (online).
“Tensor network study of $\text{SrCu}_2(\text{BO}_3)_2$ under pressure”
 - 03/21 Workshop on “Quantum Magnets in Extreme Conditions”, ISSP, Japan (online),
“Tensor network study of $\text{SrCu}_2(\text{BO}_3)_2$ under pressure”
 - 02/21 Workshop “Entanglement in Strongly Correlated Systems”, Benasque, Spain (online),
“Finite temperature iPEPS simulations of $\text{SrCu}_2(\text{BO}_3)_2$ under pressure”
 - 11/20 INT workshop: “Renormalization Group Approaches to the Many-Body Problem”, Michigan State
University, USA (online),
“Introduction to MPS, PEPS & MERA and applications in 2D”
 - 10/20 Workshop on “Emergence and Functionality of Quantum Matter 2020”, Tokyo, Japan (online),
“Simulations of the 2D Hubbard model with infinite projected entangled-pair states”
 - 03/20 Conference “Quantum Matter: Computation meet Experiments”, Aspen Center for Physics, USA,
“Tensor network studies of the Shastry-Sutherland model”
 - 11/19 Plenary speaker at the Symposium on Theoretical Physics, Hamburg, Germany,
“Simulations of the 2D Hubbard model with 2D tensor networks”
 - 09/19 Workshop at the Université Paul Sabatier, Toulouse,

- “Simulations of the 2D Hubbard model with iPEPS”
- 07/19 ISTCP Congress 2019, Tromsø, Norway,
“Simulation of strongly correlated systems with 2D tensor networks”
- 03/19 Workshop on “Tensor networks: from simulations to holography II”, Potsdam, Germany,
“Simulation of the 2D Hubbard model with iPEPS”
- 02/19 Workshop on “Perspectives in Theoretical Physics”, Hamburg, Germany,
“Recent advances in simulating strongly correlated systems with 2D tensor networks”
- 10/18 Workshop “TOPO2018: Topological Phases in Condensed Matter and Cold Atom Systems”, Cargèse, France, “Finite correlation length scaling”
- 09/18 Workshop “Quantum Magnetism: Frustration, Low-dimensionality, Topology”, UCAS, Beijing, China, “Study of 2D critical phenomena and the doped Shastry-Sutherland model with infinite projected entangled-pair states (iPEPS)”
- 01/18 Workshop “Hamiltonian methods in strongly coupled Quantum Field Theory”, Paris, France,
“Simulation of 2D strongly correlated systems with infinite projected entangled-pair states”
- 12/17 Workshop “Tensor-Network Methods: Structure, Applications & Holography”, Stony Brook, USA,
“Advances in simulating 2D strongly correlated systems with iPEPS”
- 11/17 Conference on “Frontiers in Two-Dimensional Quantum Systems”, Trieste, Italy,
“Stripe order in the 2D Hubbard model”
- 11/17 Conference on “Novel Quantum States in Condensed Matter 2017”, Kyoto, Japan,
“2D tensor network study of the $S=1$ bilinear-biquadratic Heisenberg model”
- 10/17 FISMAT 2017 conference, Trieste, Italy,
“Stripe order in the 2D Hubbard model”
- 09/17 Korrelationstage 2017, Dresden, Germany,
“Stripe order in the 2D Hubbard model”
- 06/17 Conference on “Recent Progress in Many Body Theory (RPMBT19)”, Pohang, Korea,
“Stripe order in the 2D Hubbard model”
- 10/16 The Munich Quantum Symposium 2016, Munich, Germany,
“Simulation of strongly correlated systems with 2D tensor network methods”
- 10/16 Workshop “Quantum Many-Body Methods in Condensed Matter Physics”, Aachen, Germany,
“Recent progress in simulating strongly correlated systems with 2D tensor network methods”
- 09/16 International workshop “Recent Progress in Low-Dimensional Quantum Magnetism”, EPFL,
“Crystals of Bound States in the Magnetization Plateaus of the Shastry-Sutherland Model”
- 07/16 Symposium on “Tensor Networks and Quantum Many-Body Problems (TNQMP2016)”, ISSP, Kashiwa, Japan, “Recent advances in simulating the 2D Hubbard and t-J models with iPEPS”
- 05/16 International workshop “From Quantum Field Theories to Numerical Methods”, Nordita, Stockholm, “Recent advances with iPEPS: simulations of the 2D Hubbard model, improved energy extrapolations, and variational optimization”
- 03/16 APS March meeting 2016, Baltimore, USA,
“Tensor network studies of the 2D t-J and Hubbard models”
- 02/16 Annual meeting of Collaboration on the Many Electron Problem 2016, Simons Foundation, New York, USA,
“Recent progress in simulating strongly correlated systems with 2D tensor network methods”
- 10/15 PI-UIUC joint workshop, Perimeter Institute, Waterloo, Canada,

- "Tensor network studies of 2D fermionic and frustrated systems"
- 07/15 ICTP conference "Interacting Fermions: Precision Theory and Experiment", Trieste, Italy,
"Competing states in the t-J and Hubbard models: uniform d-wave state versus stripe state"
- 06/15 International workshop and symposium on "DMRG Technique for Strongly Correlated Systems in
Physics and Chemistry", Natal, Brazil,
"Simulation of strongly correlated systems in 2D with iPEPS"
- 01/15 Physics@FOM Veldhoven meeting, Veldhoven, Netherlands,
"Simulation of 2D strongly correlated systems with tensor network methods"
- 11/14 Quantum Matter Templeton meeting, Leiden University,
"Projected Entangled-Pair States".
- 10/14 CMSI International Workshop 2014: Tensor Network Algorithms in Materials Science, Kobe,
Japan,
"Recent progress in simulating strongly correlated systems with tensor network methods".
- 09/14 International workshop on "Numerical and analytical methods for strongly correlated systems",
Benasque, Spain,
2 talks: "Introduction to tensor networks" and "Recent progress with iPEPS"
- 08/14 XXVI IUPAP Conference on Computational Physics, CCP2014, Boston, Massachusetts, USA,
"Recent progress in simulating strongly correlated systems with tensor network methods"
- 07/14 Strongly Correlated Electron Systems (SCES 2014), Grenoble, France,
"Competing states in the t-J model: uniform d-wave state versus stripe state"
- 09/13 XVII. International Conference on Recent Progress in Many-Body Theories (MBT17), Rostock,
Germany, "Simulation of strongly correlated systems 2D with tensor network algorithms"
- 06/13 International workshop on Topological Phases in Condensed Matter and Cold Atom Systems,
Institut d'Etudes Scientifiques de Cargèse (IESC), Corsica island,
"Introduction to tensor networks"
- 05/13 International workshop on Emergence and Entanglement II: Highly entangled phases of matter,
Perimeter Institute, Waterloo, Canada,
"Spin-orbital quantum liquid on the honeycomb lattice"
- 03/13 APS March meeting, Baltimore, USA,
"Spin-orbital quantum liquid on the honeycomb lattice"
- 10/12 International workshop on Cooperative Quantum Dynamics and Its Control (CQDC2012), Jülich
Supercomputing Centre (Germany),
"Simulation of strongly correlated systems 2D with infinite projected entangled-pair states"
- 06/12 Conference on Mott Physics Beyond Heisenberg 2012, EPF Lausanne,
"Tensor network simulations of spin-orbital systems"
- 05/12 Networking tensor networks: many-body systems and simulations, Benasque, Spain,
"Recent progress with infinite projected entangled-pair states"
- 05/12 DMRG Gathering 2012, Vienna,
"Simulations of SU(N) Heisenberg models with iPEPS: simplex solid states"
- 10/11 Tensor Networks for Quantum Field Theories, Perimeter Institute, Waterloo, Canada,
"Simulation of Fermionic and Frustrated Systems with 2D Tensor Networks"
- 11/10 KITP Program: Disentangling Quantum Many-body Systems, Santa Barbara, USA,
"Fermionic tensor networks"

- 06/10 Quantum information concepts in condensed matter physics, MIPPKS Dresden,
"Simulations of strongly correlated quantum systems with tensor network algorithms"
- 03/10 CECAM workshop on tensor network methods in Quantum Chemistry, ETH Zurich,
"Simulations of strongly correlated quantum systems with tensor network algorithms"
- 01/10 Thirteenth Workshop on Quantum Information Processing (QIP 2010), ETH Zurich,
"Simulations of strongly correlated quantum systems with tensor network algorithms"

Contributed talks (14)

- 01/13 MANeP workshop, Neuchatel,
"Simulations of spin-orbital models in two dimensions with tensor network algorithms"
- 01/12 MANeP workshop, Neuchatel,
"Simulation of strongly correlated systems with tensor network algorithms"
- 11/11 CECAM workshop: Modeling Materials With Cold Gases Through Simulations, ETH, "Simulation of strongly correlated systems in two dimensions with tensor network algorithms"
- 10/11 Workshop on Quantum Inf. in Quantum Many-body Physics, CRM, U. de Montréal, Canada,
"Recent progress in the simulation of strongly correlated systems in two dimensions with tensor network algorithms"
- 09/11 Swiss-Japanese Workshop, ETH Zurich,
"Recent progress in the simulatin of strongly correlated systems in two dimensions with tensor network algorithms"
- 09/11 QIPC conference, ETH Zurich, (contributed "hot-topic" talk),
"Recent advances in the simulation of strongly correlated systems in two dimensions with tensor network algorithms"
- 06/11 Annual meeting of the Swiss Physical Society (SPS), Lausanne, Switzerland,
"Simulation of fermionic and frustrated lattice models in 2D with tensor network algorithms"
- 03/11 APS March meeting, Dallas, USA,
"Simulation of fermionic and frustrated lattice models in 2D with tensor network algorithms"
- 01/11 MANeP Workshop, Neuchatel,
"Simulation of strongly correlated systems with Projected Entangled-Pair States (PEPS)"
- 07/10 STATPHYS24, Cairns, Australia,
"Simulation of fermionic lattice models in two dimensions with tensor network algorithms"
- 01/10 Workshop on tensor networks, MPI Garching, Germany,
"Simulations of strongly correlated quantum systems with tensor network algorithms"
- 05/07 Quantum Noise workshop 2007, Caloundra, Australia,
"The Gaussian Quantum Monte Carlo method for fermions with symmetry projection"
- 03/07 March meeting of the American Physical Society, Denver, Colorado, USA,
"Bilinear-Biquadratic Spin 1 Zig-Zag Chain"
- 02/07 SPS annual meeting, University of Zurich, Switzerland,
"Bilinear-Biquadratic Spin 1 Zig-Zag Chain"

Poster presentations (10)

- 02/12 QSIT meeting, Arosa, Switzerland,
"Tensor network algorithms"
- 06/11 Swiss Workshop MaNEP, Les Diablerets, Switzerland,
"Striped phase in the t-J model with infinite projected entangled-pair states"
- 01/11 QSIT meeting, Arosa, Switzerland,
"Tensor network states"
- 08/08 ULT2008: Frontiers of Low Temperature Physics, University of London, Egham,
"Phase diagram of ^4He adsorbed on graphite"
- 03/08 SPS annual meeting, Geneva, Switzerland,
"Spontaneous trimerization in a bilinear-biquadratic $S=1$ zig-zag chain"
- 09/07 Swiss Workshop MaNEP, Les Diablerets, Switzerland,
"Spontaneous trimerization in a bilinear-biquadratic $S=1$ zig-zag chain"
- 01/07 Workshop on Highly Frustrated Magnetism, Dresden, Germany,
"Bilinear-Biquadratic Spin 1 Zig-Zag Chain"
- 12/06 Colloque numerique Suisse, EPFL, Switzerland,
"The Gaussian Quantum Monte Carlo method for fermions with symmetry projection"
- 11/05 C4 Workshop, ETH Zurich,
"The Gaussian Quantum Monte Carlo method for fermions with symmetry projection"
- 10/05 Swiss Workshop MaNEP, Les Diablerets, Switzerland,
"The Gaussian Quantum Monte Carlo method for fermions with symmetry projection"

Invited seminars and colloquia (43)

- 03/23 CompQu seminar, NCTS, Taiwan (online),
"iPEPS: ground states, finite temperature, excitations, and extensions to 3D"
- 01/23 Physics Colloquium at ENS Paris, France,
"Simulating strongly correlated systems with tensor network algorithms"
- 10/22 ETH Zurich, Switzerland,
"Simulation of quantum many-body systems with tensor network algorithms"
- 03/21 University of Manchester, UK (online),
"Tensor network studies of the Shastry-Sutherland model"
- 03/21 University of Geneva, Switzerland (online),
"State of the art of 2D tensor networks"
- 06/20 European Tensor Network online seminar series,
"Simulations of the 2D Hubbard model with iPEPS"
- 04/20 HEP-TN online seminar (www.heptnseminar.org),
"Simulation of strongly correlated systems with infinite projected entangled-pair states (iPEPS)"
- 06/19 University of Cologne, Germany,
"Stripes in the 2D Hubbard model and finite correlation length scaling with iPEPS"
- 03/19 EPFL Switzerland,
"Simulation of quantum many-body systems with tensor network algorithms"

- 03/19 MPIPKS Dresden, Germany,
"Simulation of the 2D Hubbard model and finite correlation length scaling with iPEPS"
- 04/18 University of Leiden, Netherlands,
"2D tensor network algorithms applied to the 2D Hubbard model"
- 10/17 University of Stuttgart, Germany,
"Simulation of strongly correlated systems with iPEPS"
- 06/17 Amsterdam Machine Learning Lab, University of Amsterdam,
"Introduction to tensor networks"
- 12/16 King's College, London, UK,
"Tensor network studies of 2D fermionic and frustrated systems"
- 11/16 Radboud University, Nijmegen, Netherlands,
"Simulation of strongly correlated quantum many-body systems"
- 10/16 University of Amsterdam, Netherlands,
"Simulation of strongly correlated quantum many-body systems"
- 09/16 University of Ghent, Belgium,
"Recent progress in simulating strongly correlated systems with 2D tensor network methods"
- 04/16 QuSoft, CWI, Amsterdam,
"Introduction to tensor networks"
- 11/15 Utrecht University, Netherlands,
"Tensor network studies of 2D fermionic and frustrated systems"
- 10/15 University of Oxford, UK,
"Simulation of fermionic and frustrated systems with 2D tensor networks"
- 10/14 University of Tokyo, Japan,
"Recent progress in simulating strongly correlated systems with 2D tensor network methods"
- 06/14 RWTH Aachen, Germany,
"Tensor network studies of the t-J and the Shastry-Sutherland model"
- 07/13 University of Cologne, Germany,
"Simulation of strongly correlated systems in two dimensions with tensor network algorithms"
- 04/13 University of Amsterdam, Netherlands,
"Simulation of strongly correlated systems in two dimensions with tensor network algorithms"
- 03/13 University of Basel, Switzerland,
"Simulation of strongly correlated systems in two dimensions with tensor network algorithms"
- 03/13 University of Zurich, Switzerland, "Simulation of strongly correlated systems in two dimensions with tensor network algorithms"
- 12/12 ICFO, Castelldefels, Barcelona, Spain,
"Recent progress in the simulation of strongly correlated systems in two dimensions with tensor network algorithms"
- 11/12 LMU Munich,
"Tensor network studies of exotic phases in SU(N) Heisenberg models"
- 03/12 Theory Colloquium at ETH,
"Simulation of strongly correlated systems in two dimensions with tensor network algorithms"
- 11/10 EPFL, Switzerland,
"Introduction to tensor network algorithms"

- 04/10 MPIPKS, Dresden, Germany,
"Simulation of fermionic lattice models in two dimensions with tensor network algorithms"
- 02/10 ETH Zurich, Switzerland,
"Simulation of fermionic lattice models in two dimensions with tensor network algorithms"
- 02/10 EPFL, Switzerland,
"Simulation of fermionic lattice models in two dimensions with tensor network algorithms"
- 11/09 University of Queensland, Brisbane, Australia,
"On the formalism of fermionic tensor networks"
- 10/09 University of Queensland, Brisbane, Australia,
"Simulation of fermionic lattice models in two dimensions with tensor network algorithms"
- 10/08 University of Queensland, Brisbane, Australia,
"Phase diagram of Helium-4 films adsorbed on a graphite substrate"
- 07/08 ETH Zurich, Switzerland,
"Phase diagram of Helium-4 films adsorbed on a graphite substrate"
- 05/07 University of Queensland, Brisbane, Australia,
"The Gaussian Quantum Monte Carlo method with symmetry projection"
- 05/07 University of Tokyo, Hongo, Tokyo, Japan,
"The Gaussian Quantum Monte Carlo method with symmetry projection"
- 05/07 ISSP, University of Tokyo, Kashiwa, Japan,
"The Gaussian Quantum Monte Carlo method with symmetry projection"
- 03/07 Boston University, USA
"The Gaussian Quantum Monte Carlo method with symmetry projection"
- 03/07 University of Southern California, Los Angeles, CA, USA,
"The Gaussian Quantum Monte Carlo method with symmetry projection"
- 02/07 University of California, Irvine, CA,
"The Gaussian Quantum Monte method with symmetry projection"
"Bilinear-biquadratic Spin 1 Zig-Zag chain"

Invited lectures at international schools (13)

- 09/22 ICTS program "Frustrated Metals and Insulators (hybrid)", Bangalore, India,
"Introduction to tensor networks"
- 09/21 European Tensor Network - ICCUB School 2021, Barcelona, Spain,
2 lectures and tutorials "Introduction to Projected entangled pair states (PEPS) and numerical simulations with PEPS"
- 02/20 International school and workshop on "Entanglement in Strongly Correlated Systems", Benasque, Spain, "Introduction to infinite projected entangled pair states" (3 lectures)
- 11/18 International school "Tensor product state simulations of strongly correlated systems", MPIPKS, Dresden, Germany, "Projected entangled-pair states" (2 lectures)
- 10/18 Workshop "TOPO2018: Topological Phases in Condensed Matter and Cold Atom Systems", Cargèse, France, "Introduction to iPEPS"
- 03/18 DRSTP PhD school, Dalfsen, Netherlands,
"Introduction to tensor networks for quantum many-body systems"

- 09/17 Arnold Sommerfeld School on "Numerical methods for correlated many-body systems", Munich, "Projected entangled-pair states (PEPS)"
- 11/16 International school "Tensor product state simulations of strongly correlated systems", MPIPKS, Dresden, Germany, "Projected entangled-pair states" (2 lectures)
- 07/16 Workshop on "Tensor Networks and Quantum Many-Body Problems (TNQMP2016)", ISSP, Japan "Introduction to iPEPS" (2 lectures)
- 06/16 International summer school of the "Many Electron Problem Collaboration", Simons Center, Stony Brook, USA, "MERA", "PEPS", and "Advanced Tensor Network Applications" (3 lectures)
- 06/15 International "Tensor Network Summer School" in Ghent, Belgium, "PEPS Algorithms and Implementations" (2 lectures)
- 10/13 Fall school on "Advanced algorithms for correlated quantum matter", Würzburg, Germany, "Introduction to tensor network algorithms"
- 06/12 International summer school on "new trends in computational approaches for many-body systems", Sherbrooke, Canada. "PEPS" and "Fermionic tensor networks" (2 lectures)