

Curriculum Vitae

Name: Philippe Roger Corboz
Nationality: Swiss
Place of origin: Oron (VD) and Maraçon (VD), Switzerland
Date of birth: February 5, 1978
Address: Institute for Theoretical Physics
University of Amsterdam
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Languages: German, English, French (all fluent), Dutch (B1)



Professional career

05/18 – now Associate Professor in Theoretical Condensed Matter Physics,
Institute for Theoretical Physics, University of Amsterdam
05/14 – 04/18 Assistant Professor in Theoretical 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

Professional experience in industry

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

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 best grades in final exams (Master degree)

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

Grants

- 07/16 PhD Grant from the Delta ITP Diversity program (co-applicant with L. Fritz, D. Schuricht, Utrecht).
11/15 ERC starting grant, “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

Main research fields

- Strongly correlated fermionic systems (Hubbard / t-J model, high- T_c superconductivity, ultra-cold atoms in optical lattices, spin-orbital systems)
- Strongly correlated bosonic systems (Helium-4, Helium films, supersolids)
- Frustrated spin systems (SU(N) Heisenberg models, spin liquids, frustrated Heisenberg models, systems with topological order, Shastry-Sutherland model)
- Tensor network algorithms (DMRG, MERA, PEPS) with focus on 2D systems
- Quantum Monte Carlo (MC) methods (worm algorithm, Gaussian MC, variational MC)
- Development of numerical algorithms for the simulation of strongly correlated system

Expertise

- Condensed matter physics & computational physics
- Quantum many-body physics and strongly correlated systems
- Algorithms for the simulation of strongly correlated systems
- Programming in C++, MATLAB, Python, Mathematica, C#, Java, bash
- Parallelization of codes for large computer clusters

Teaching experience

- 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” at the 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” at the UvA
- 09/15 – 06/16 Didactic program “Basiskwalificatie Onderwijs (BKO)” at the 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” at the 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
- 06/12 – 06/14 Lecture on “DMRG and tensor network states” in the “Computational Physics” lecture at ETH Zurich
- 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

- 09/18 – now M. Tepaske, M.Sc. thesis “Neuronal Network Quantum States”
- 09/18 – now R. Timmermanns, M.Sc. thesis “Tree tensor networks and visualization of quantum fluctuations”
- 09/17 – 08/18 R. van der Werff, M.Sc. thesis “Simulating classical spin systems using the Fixed Point Corner Method”
- 09/17 – 07/18 P. Vlaar, M.Sc. thesis “3D tensor network simulations using simple update optimization”
- 04/18 – 07/18 F. van der Ploeg, B. Sc. Thesis “Simulation of the two-dimensional Ising model using the Corner Transfer Matrix Renormalization Group method on the square, honeycomb, and triangular lattice
- 09/16 – 02/18 K. Temmink, M.Sc. thesis “On tensor network methods for one-dimensional open quantum systems”, *joint project together with dr. V. Gritsev (UvA)*

- 06/17 – 07/17 F. van der Ploeg, D. van den Bergh, 2nd year project on “Simulation of the site-percolation problem on a two-dimensional square lattice”
- 07/16 – 08/17 B. Ponsioen, M.Sc. thesis “Combining Variational Optimization with Entanglement Renormalization in a Tensor Network framework”
- 07/16 – 08/17 G. Kapteijns, M.Sc. thesis “Finite bond dimension scaling with the corner transfer matrix renormalization group method”
- 04/16 – 07/16 R. van der Werff, B.Sc. thesis “Simulating classical spin systems using the Corner Transfer Matrix Renormalization Group method”
- 04/16 – 07/16 T. Zwart, B.Sc. thesis “Monte Carlo Simulations of the 3-State Potts Model in 2D”
- 09/15 – 08/16 L. Schoonderwoerd, M.Sc. thesis “DMRG with local unitary transformations”
- 09/15 – 08/16 S. Crone, M.Sc. thesis “Tensor network renormalization”
- 07/14 – 07/18 I. Niesen, Ph.D thesis on “Simulations of triangular lattice frustrated spin systems with infinite projected entangled-pair states”, UvA
- 10/14 – 10/15 E. van Walsem, M.Sc. thesis “Quantum Monte Carlo simulations of bosons in 2D lattices”, *joint project with the experimental group of dr. R. Spreeuw (UvA)*
- 06/12 – 08/17 J. Osorio, Ph.D thesis on “Connecting the Dots tensor network algorithms for two-dimensional strongly-correlated systems”, ETH Zurich
- 05/14 – 07/14 Second assessor of Bachelor theses:
 B.A. van Voorden: “Generalization of Haldane’s Chern Insulator model”,
 D. Gunneweg: “From few to many”,
 R. Albers: “Quantum world on a sphere”,
 S. Crone: “Phase transition of Light”
- 09/13 – 12/13 D. Casati, CSE seminar on “Matrix-product states”
- 03/13 – 06/13 D. Rodic, CSE seminar on “The Wang-Landau algorithm”
- 03/12 – 08/12 M. Obrecht, master thesis “Simulation of one dimensional quantum systems at finite temperature with minimally entangled typical thermal states”
- 03/12 – 06/12 M. Voss, Theoretical Physics Proseminar on “Matrix-product states and projected entangled-pair states”
- 03/12 – 06/12 P. Strassmann, Theoretical Physics Proseminar on “The Density-Matrix Renormalization Group”
- 03/12 – 06/12 R. Gantner, CSE seminar on “Matrix-product states and DMRG”
- 09/11 – 12/11 S. Pintarelli, CSE seminar on “Matrix-product states”
- 03/11 – 06/11 M. Nescher, CSE seminar on “Area law and entanglement”
- 10/07 – 02/08 P. Sémon, master thesis “Pre-projected Gaussian Quantum Monte Carlo for Hubbard ladders”

Member of PhD committees

- 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)

Event organization

Scientific events

- 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

Non-scientific events

- 2002 – 2006 Co-organizer in the cultural association “Drehmoment” in Wohlen, Switzerland (concerts, exhibitions, and performing arts events)
- 06/02 Organizer of the Open Air festival “We are the world” in Wohlen, Switzerland (approx. 2000 people)

Other activities

- 09/16 – now Jury member of the *Pieter Zeeman price*
(reviewing ~20 of the best Master theses in Physics, bi-annually)
- 11/16 – now Webpage administrator of the Condensed Matter Theory group at the UvA
- 09/14 – now Organizer of the weekly Condensed Matter Theory seminar at the UvA (>120 seminars)
- 03/08 – now Reviewer for
- Physical Review Letters
 - Physical Review B
 - Europhysics Letters
 - European Physical Journal B
 - Journal of Statistical Physics
 - New Journal of Physics
 - Journal of Physics: Condensed Matter
 - SciPost
 - NPJ Quantum Materials
- 02/14 – now Project proposal reviewer for
- Research Foundation Flanders (FWO)
 - Deutsche Forschungsgemeinschaft (DFG)
 - European Research Council (ERC)
- 01/05 – 09/08 Contributor to the ALPS project (alps.comp-phys.org)
- 11/05 – 11/07 Public presentations on Physics with “ETH en route” at Swiss high-schools
- 10/05 Supervision in project week at ETH by “Schweizer Jugend forscht” on Brownian motion

Publications and Presentations summary

Total publications (42 peer-reviewed papers, 1 book chap., 2 theses, 1 proceeding, 1 preprint)	47
First-author publications	23
Total paper citations ¹	2527
h-index ¹	26
Invited conference talks (38), invited seminars (33), and invited lectures (8)	79
Contributed conference presentations (talks + posters)	24

Publication list

Peer-reviewed articles

- [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).

¹ Google Scholar in October 2018

- [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*

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

- [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 SrCu₂(BO₃)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)
- [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*,
P. Corboz, K. Penc, F. Mila, and A. M. Läuchli,
Phys. Rev. B 86, 041106 (2012). *Rapid Communication*
- [17] *Comment on "Topological quantum phase transitions of attractive spinless fermions in a honeycomb lattice" by D. Poletti et al.*,
P. Corboz, S. Capponi, A. M. Läuchli, B. Bauer, R. Orus,
Europhys. Lett. 98, 27005 (2012)
- [16] *Three-sublattice order in the SU(3) Heisenberg model on the square and triangular lattice*,
B. Bauer, P. Corboz, A. M. Läuchli, L. Messio, K. Penc, M. Troyer, F. Mila,
Phys. Rev. B 85, 125116 (2012)
- [15] *Simultaneous dimerization and SU(4) symmetry breaking of 4-color fermions on the square lattice*,
P. Corboz, A. M. Läuchli, K. Penc, M. Troyer, F. Mila,
Phys. Rev. Lett. 107, 215301 (2011)

- [14] *Stripes in the two-dimensional t-J model with infinite projected entangled-pair states*,
P. Corboz, S. R. White, G. Vidal, and M. Troyer,
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).
This article has been selected for the January 2011 issue of Virtual Journal of Quantum Information, and for the January 3, 2011 issue of Virtual Journal of Nanoscale Science & Technology
- [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).
This article has been selected for the October 2010 issue of Virtual Journal of Quantum Information, and for the October 4, 2010 issue of Virtual Journal of Nanoscale Science & Technology
- [9] *Simulation of strongly correlated fermions in two spatial dimensions with fermionic projected entangled-pair states*,
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,
Phys. Rev. A 81, 010303 (2010). *Rapid Communication*
- [7] *Fermionic multi-scale entanglement renormalization ansatz*,
P. Corboz and G. Vidal,
Phys. Rev. B 80, 165129 (2009).
This article has been selected for the November 2009 issue of Virtual Journal of Quantum Information, and for the November 9, 2009 issue of Virtual Journal of Nanoscale Science & Technology
- [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

- [1] *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

- [1] *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

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

Preprints

- [1] *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,
ArXiv:1808.02043

Conference presentations

Invited conference talks (38)

- 10/18 Workshop "TOPO2018: Topological Phases in Condensed Matter and Cold Atom Systems", Cargèse, France, "Study of 2D critical phenomena with infinite projected entangled-pair states"
- 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,
"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 seminar talks (33)

- 03/18 University of Leiden, Germany,
"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 (8)

- 11/18 International school "Tensor product state simulations of strongly correlated systems", MPIPKS, Dresden, Germany,
"Projected entangled-pair states" (2 lectures)
- 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)