Prof. Michael M. Wolf

Areas of expertise:	**Mathematical Physics,** **Quantum Information Theory**
Affiliation:	Department of Mathematics Technical University of Munich (TUM) Boltzmannstrasse 3, 86587 Garching
E-Mail:	m.wolf@tum.de
Year of Birth:	1974
Citizenship:	German
ResearcherID:	J-8135-2016

PROFESSIONAL EXPERIENCE AND POSITION(S)

2011 – today	Head of the Chair of Mathematical Physics Department of Mathematics, Technical University of Munich (Germany)
2008 – 2011	Ole Roemer Professor Niels Bohr Institute, University of Copenhagen (Denmark)
2003 – 2008	Assistant / postdoc Max-Planck-Institute of Quantum Optics, Garching (Germany)

EDUCATION

2003	PhD, Institute for Mathematical Physics, TU Braunschweig (Germany) Supervisor: Prof. Reinhard Werner
1999	Diploma in Physics, Ruprecht-Karls-University Heidelberg (Germany) Thesis in High-Energy Physics in collaboration with CERN
1993	Abitur, Welfen-Gymnasium Schongau (Bavaria, Germany)

AWARDS & HONORS

2025	Visiting Scholar Fellowship, Pembroke College Cambridge (March-July)
2025	IMPRS & MCQST Supervision Award
2022	ISAM Supervisory Award
2019	Best writings in Mathematics
2013-2022	Six teaching awards for lectures in Physics & Mathematics at TUM
2011	Returning Scientists Award by the Alfried Krupp von Bohlen und Halbach Foundation
2008	Young Elite Researcher's Award of the Danish Council for Independent Research
2008	Ole Roemer Professorial Fellowship
2007	QIPC European Young Investigator Award

BOARD MEMBERSHIPS

2017 - today	Executive Committee, Munich Center of Quantum Science & Technology
2015 - 2021	Editorial Board, Communication in Mathematical Physics
2014 - today	Editorial Board, Journal of Mathematical Physics
2014 - 2017	Editorial Board, Journal of Physics A
2010 - 2018	Executive Secretary of the European Virtual Institute of Quantum Computing / Quantum Information Theory

Selected Publications

(total: >130 publications, >20000 citations, h-index 62 (Google Scholar, June 2025))

(1) Undecidability of the spectral gap
T. Cubitt, D. Perez-Garcia, M.M. Wolf
Nature, **528**, 207-211 (2015);
Forum of Mathematics, Pi **10** (2022).

(2) Quantum computation and quantum-state engineering driven by dissipation
F. Verstraete, M.M. Wolf, J.I. Cirac
Nature Physics **5**, 633 - 636 (2009).

(3) Matrix product state representations
D. Perez-Garcia, F. Verstraete, M.M. Wolf, J.I. Cirac
Quantum Inf. Comput. **7**, 401 (2007).

(4) Violation of the entropic area law for fermions
M.M. Wolf
Phys. Rev. Lett. **96**, 010404 (2006).

(5) Area laws in quantum systems: mutual information and correlations
M.M. Wolf, F. Verstraete, M.B. Hastings, J.I. Cirac
Phys. Rev. Lett. **100**, 070502 (2008).

(6) Dividing quantum channels
M.M. Wolf, J. I. Cirac
Commun. Math. Phys. **279**, 147 (2008).

(7) Quantum tomography under prior information
T. Heinosaari, L. Mazzarella, M.M. Wolf
Commun. Math. Phys. **318**, 355-374 (2013).

(8) Quantum capacities of bosonic channels
M.M. Wolf, D. Perez-Garcia, G. Giedke
Phys. Rev. Lett. **98**, 130501 (2007).

(9) An improved Landauer principle with finite size corrections
D. Reeb, M.M. Wolf
New J. Phys. **16**, 103011 (2013).

(10) Quantum memory for entangled continuous-variable states
K. Jensen, W. Wasilewski, H. Krauter, T. Fernholz, B.M. Nielsen, A. Serafini, M. Owari, M.B. Plenio, M.M. Wolf, E.S. Polzik
Nature Physics **7**, 13-16 (2011).

(11) Hay from the haystack: explicit examples of exponential quantum circuit complexity
Y. Jia, M.M. Wolf
Commun. Math. Phys. **402**, 141 (2023).

(12) Size-driven quantum phase transitions
J. Bausch, T.S. Cubitt, A. Lucia, D. Perez-Garcia, M.M. Wolf
Proc. Natl. Acad. Sci. **115** 19-23 (2017).