



Curriculum vitae

Jens Eisert

European Young Research Investigator Award (EURYI) fellow
Professor of theoretical physics

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Institute for Advanced Study Berlin

Wallotstr. 19
D-14193 Berlin

Imperial College London

Visiting academic
Prince Consort Road, SW7 2BW London

University of Potsdam

Karl-Liebknecht-Str. 24
D-14476 Potsdam

Personal details

Date of birth	9th of October 1970
Nationalities	German and Swedish
Marital status	Single

Academic appointments

May 2008 –	Full professor, W3 , University of Potsdam
Oct. 2009 – July 2010	Institute for Advanced Study Berlin Fellow , Berlin
Mar. 2005 –	European Young Investigator Award Fellow
Mar. 2005 – May 2008	Lecturer (permanent), Institute for Mathematical Sciences, Imperial College London
Dec. 2002 – Mar. 2005	Junior Professor , Quantum Optics and Quantum Information, University of Potsdam Visiting Lecturer , Quantum Optics and Laser Science Group (QOLS), Imperial College London
Dec. 2002 – Jan. 2003	Visiting Scholar , IQI, California Institute of Technology
July 2001 – Nov. 2002	Feodor Lynen Fellow in QOLS, Imperial College London
Feb. 2001 – July 2001	Postdoctoral researcher in the group of Martin Plenio, QOLS, Imperial College London, supported by the European Commission
April 1998 – Jan. 2001	Research assistant at the University of Potsdam

Research interests:

Quantum information and quantum many body theory

- Quantum entanglement and computation
- Quantum optical implementations of quantum information ideas
- Non-equilibrium dynamics of quantum many-body systems
- Simulation of quantum many-body systems
- Ultra-cold atomic gases in optical lattices
- Quantum statistical physics
- Decoherence, open quantum systems, and optomechanical systems

Publications:

- **100 scientific publications**, of which
- **31** published in the *Physical Review Letters*
- **1** in *Nature Physics* and **1** in *Nature*, News and Views
- **8** in invited book chapters
- several preprints (excluding non-refereed conference contributions)

Citations:

- **>3000 citations** according to *Web of Science* (Cited Ref Search, including first author preprints)
- **7** publications with more than 100 citations (Cited Ref Search)

Invited talks:

>120 invited talks at conferences, workshops, in seminars and colloquia

Scientific press coverage:

Articles about my work in *Nature*, *Science*, *Physics World*, *Scientific American*, *New Scientist*, *Physics News*, *MIT Technology Review*, public science programmes about my work on *BBC Radio 4* and on the public German channel *3SAT*

PhD

April 1998 – Jan. 2001 **PhD, University of Potsdam, Germany**
Thesis advisor: Prof M. Wilkens
Title: *“Entanglement in Quantum Information Theory”*
Key topics: structure of quantum entanglement in multi-partite quantum systems, optimization techniques in quantum information theory, distributed quantum computing and game theory
Final grade: **Summa cum laude** (highest distinction)

Education

1995-1998, 1991-1994 **Albert Ludwigs University Freiburg, Germany**
Undergraduate and postgraduate studies in Physics
Degree: **Diploma in Physics**
Final grade: **very good**,
Grading scale: very good, good, satisfactory, sufficient
Topic of dissertation: *“Quantum Brownian Motion: A Quantum Monte Carlo Approach”*. Analytical work and computer-aided Monte-Carlo simulations of open quantum systems

1994 – 1995 **University of Connecticut, USA, as a J.W. Fulbright Fellow**
Postgraduate studies in Mathematics and Physics
Degree: **Master of Science**
GPA: **3.88**, grading scale: A – 4.0, . . . , – 1.0
Scientific work in applied mathematics/numerical analysis:
efficient numerical solution of integral equations

1981 – 1990 **Wilhelm von Humboldt Gymnasium, Ludwigshafen, Germany**
Degree: **Abitur**
Average mark: **1.0**, grading scale: 1.0, 1.1, 1.2, . . . , 4.0

Grants, honours, and awards

2009 Elected Fellow of the **Institute for Advanced Study Berlin**

2008 Elected **member of the Editorial Board of Quantum Information and Computation**

2007 Elected **member of the Editorial Board of Physical Review A**

2004 **European Young Investigators Award** (endowed with > 1 Mio Euros), awarded in Stockholm, August 2004.

2002 **Michelson Price**, University of Potsdam 2001

2001 – 2002 **Feodor Lynen Scholarship** of the Humboldt Foundation

1995	Scholarship of the UCONN Research Foundation
1995	Elected member of Sigma-Pi-Sigma Honor Society
1994 – 1995	J. W. Fulbright Scholarship
1990	Various prizes for outstanding achievements in high school classes

Group leading skills

■ **Diploma or MSc supervision:**

(Diploma: One year of full-time research work)

- Holger Bernigau (Diploma, Potsdam), presently Diploma student
- Inka Benthin (Diploma, Potsdam), presently Diploma student
- Wendell Smith, presently MSc student, joining Yale in 2010
- Janet Anders (Diploma, Potsdam)
- David Gross (Diploma, Potsdam)
- Axel Friedenauer (Diploma, Potsdam)
- Co-supervision of Holger Hofmann (Diploma, Potsdam), jointly with M. Wilkens
- Co-supervision of Tim Mannveille (MSc, Imperial College), jointly with S. Scheel

■ **PhD supervision:**

- Andrea Mari (Potsdam), presently PhD student
- Matthias Ohliger (Potsdam), presently PhD student
- Marcus Cramer (Potsdam)
- David Gross (Imperial College)
- Konrad Kieling (Imperial College)
- Fernando Brandao (Imperial College), with M.B. Plenio
- Alvaro Feito (Imperial College), jointly with M.B. Plenio

■ **Postdoctoral researchers:**

- Thomas Barthel
- Carlos Pineda
- Niel de Beaudrap
- Markus Müller, jointly with TU Berlin
- Dong Yang
- Phil Hyllus
- Chris Dawson
- Kenny Pregnell, jointly with M.B. Plenio
- Marcus Cramer

Organizational skills

- **QQQ-Meeting**, regular meeting in the Berlin-Potsdam academic landscape on quantum information, quantum optics, and quantum many-body theory (organizer and co-founder)
Web address: <http://www.jense.qipc.org/Meeting.html>
- **Summer adademy of the Studienstiftung des deutschen Volkes, Görlitz 2008**, course on quantum information theory, August 2008, jointly with A. Rauschenbeutel, Mainz
- **PAQ07, head of local organizing committee**, major international conference on quantum optics and quantum information, Royal Society London, September 2007.
Web address: <http://www.paqconf.org>
International steering committee: B. Sanders (Calgary), J. Eisert (Imperial), A. Ekert (Oxford and Singapore), V. Buzek (Bratislava)
- **Summer adademy of the Studienstiftung des deutschen Volkes, Rot an der Rot 2004**, course on quantum information theory, August 2004, jointly with R.F. Werner, Technische Universität Braunschweig
- **IQING 2002**, organizer of an international conference for PhD students and postdocs on quantum information science in theory and experiment
Web address: <http://www.qols.ph.ic.ac.uk/jense/IQING.html>
- **IQING 2001**, jointly jointly with C. Simon (Oxford) and Germany. Jonathan (Cambridge), 2001
- Contributed to the organization of the **QIPC Workshop** of the European Commission, 2000
- **YAO '99 – Young Atom Opticians**, jointly with T. Felbinger and C. Henkel (Potsdam), 1999
- **A2-Consortium For Quantum Information**, jointly with M. Wilkens (Potsdam), 1998 – 2001, 2003.

Documentation of international collaborations

- Coauthors of already published scientific work are
K. Audenaert (Leuven, Belgium), A. Albus (Potsdam, Germany), M. Aspelmeyer (Wien, Austria), T. Barthel (Potsdam, Germany), S. Becker (Caltech, USA), S.C. Benjamin (Oxford, UK), S. Bose (London, UK), K. Bongs (Hamburg, Germany), F. Brandao (London, UK), H.J. Briegel (Innsbruck, Austria), J. O'Brien (Bristol, UK), D.E. Browne (Oxford, UK), C. Brukner (Wien, Austria), D. Bouwmeester (Santa Barbara, USA), C.K. Burrell (Royal Holloway, UK), F. Caruso (Pisa, Italy), J.I. Cirac (Garching, Germany), H. Coldenstrodt-Ronge (Oxford, UK), M. Cramer (Potsdam, Germany), T. Cubitt (Bristol, UK), M. Curty (Erlangen, Germany), B. De Moor (Leuven, Belgium), J. Dreissig (Potsdam, Germany), W. Dür (Innsbruck, Austria), G.A. Durkin (Santa Barbara, USA), T. Felbinger (Potsdam, Germany), A. Feito (London, UK), S. Flammia (Perimeter Institute, Canada), G. Giedke (Zürich, Switzerland), S. Gigan (Wien, Austria), O. Gittsovich (Innsbruck, Austria), V. Giovannetti (Pisa, Italy), D. Gross (Potsdam, Germany), O. Gühne (Hannover, Germany), J. Hartley (London, UK), L. Hartmann (Innsbruck, Austria), M. Hein (Innsbruck, Austria), A.S. Holevo (Moscow, Russia), P. Hyllus (Hannover, Germany), F. Illuminati (Salerno, Italy), E. Jane (Barcelona, Spain), K. Jacobs (Los Alamos, USA), K. Kieling (London, UK), M.S. Kim (Belfast, UK), P.L. Knight (London, UK), P. Kok (Hewlett Packard Bristol, UK),

J.I. Latorre (Barcelona, Spain), M. Lewenstein (Barcelona, Spain), Y.-K. Liu (Caltech, USA), P. Lougovsky (Baton Rouge, USA), J.S. Lundeen (Oxford, UK), W. Mauerer (Erlangen, Germany), I.P. McCulloch (Queensland, Australia), W.J. Munro (Hewlett Packard Bristol, UK), K. Nemoto (Tokyo, Japan), M. van den Nest (Leuven, Belgium), J.L. O'Brien (Bristol, UK), R. Orus (Barcelona, Spain), T.J. Osborne (Royal Holloway, UK), C. Ospelkaus (Boulder, USA), S. Ospelkaus (Boulder, USA), P. Papadopoulos (London, UK), M. Paternostro (Belfast, Nordirland, UK), D. Perez-Garcia (Madrid, Spain), C. Pineda (Potsdam, Germany and Mexico, Mexico), K. Pregnell (London, UK), M.B. Plenio (London, UK), T.C. Ralph (Queensland, Australia), R. Raussendorf (Pasadena, USA), T. Rudolph (London, UK), S. Scheel (London, UK), B.C. Sanders (Calgary, Canada), U. Schollwöck (Aachen, Germany), N. Schuch (Garching, Germany), K. Senostock (Hamburg, Germany), A. Serafini (Salerno, Italy), C. Silberhorn (Erlangen, Germany), C. Simon (Grenoble, Frankreich and Santa Barbara, USA), B.J. Smith (Oxford, UK), T.M. Stace (Cambridge, UK), T. Tyc (Brno, Czech Republic), D.B. Uskov (Baton Rouge, USA), N.M. Van Meter (Baton Rouge, USA), S. Virmani (London, UK), D. Vitali (Camerino, Italy), R.F. Werner (Braunschweig, Germany), I.A. Walmsley (Oxford, UK), M. Wilkens (Potsdam, Germany), H.M. Wiseman (Griffiths, Australia), M.M. Wolf (Copenhagen, Denmark), D. Yang (Potsdam, Germany).

Editorial board memberships

- **Editor of Physical Review A**, divisional editor for quantum information
- **Editor of Quantum Information Processing**
- **Board member** of the European Road Map committee for quantum information
- **Coordinator and author** of the theory part of the new European Road Map for quantum information

Referee for research grants and posts

- **ERC** startup grant, European Commission
- **Australian Research Council ARC**, Australia
- **Royal Society**, UK
- **EPSRC** long term grants, UK
- **Leverhulme Trust**, UK
- **German Israeli Foundation (GIF)**, Israel and Germany
- **Studienstiftung des Deutschen Volkes**, Germany
- **Deutschen Akademischen Austauschdienst DAAD**, Germany
- **Ignaz-Lieben Award**, Austria
- **Feodor-Lynen-Program** of the Alexander-von-Humboldt-Foundation, Germany
- Frequent referee for **postdoc programs** (many letters of recommendation)
- Frequent **PhD examiner**, locally at Imperial and in Potsdam

- **PhD examiner** in international committees
 - Sebastien Louis, Tokyo, 2008
 - Simon Anders, Innsbruck, Austria, 2007
 - Sean Clark, Bristol, UK, 2007
 - Azhar Iqbal, Hull, UK, 2006
 - Maarten van den Nest, Leuven, Belgium, 2005
 - Marc Hein, Innsbruck, Austria, 2005
 - Adrian Flitney, Adelaide, Australia, 2004

Research grants

- Proposal to the **Humboldt-Foundation**, Bessel programme (to finance a stay of T. Prosen for a year): granted 2009
- Proposal to the **Humboldt-Foundation**, Bessel programme (to finance a stay of M. Aspelmeyer for a year): granted 2009
- Subproject Leader (theory), proposal to the **European Commission**, Integrating Project QES-SENCE, major European network on quantum information 2009 (postdoc position, travel money, computer funds): granted 2009
- Coauthor of a proposal to the **European Commission**, STREP MINOS, optomechanical coupling, 2007 (postdoc position, travel money, computer funds): granted 2008
- Coauthor of a proposal to the **European Commission**, STREP COMPAS, quantum information science with continuous variable systems, 2007 (postdoc position, travel money, computer funds): granted 2007
- **European Young Research Investigator Award** (academic post and three additional research positions, travel money, computer equipment), >1 Mio Euros in total, granted 2004, started 2005
- Coauthor and work package leader, proposal to the **European Commission**, 6th Framework Programme, Integrating Project, QAP, Qubit Applications, 2005 (postdoc position, travel money, computer funds): positively evaluated and granted 2005
- Coauthor of a proposal to the **German Research Foundation**, SPP ultra-cold atoms, SPP-1116 (PhD position): positively evaluated and granted 2005
- Author of proposal to the **Microsoft Research Foundation** (PhD position, travel funds): positively evaluated and granted 2005
- Coauthor of a research grant to the **EPSRC** (postdoc position, equipment), with I.A. Walmsley and M.B. Plenio: positively evaluated and granted 2005
- Author of a proposal to the **European Kommission**, 5th Framework Programme, Rahmenprogramm, QUPROCON, with M. Plenio: positively evaluated and granted 2003

- Author of a proposal to the **German Research Foundation**, SPP quantum information processing, SPP-1078 (PhD position): positively evaluated and granted 2003
- Coauthor of a proposal to the **German Research Foundation**, SPP quantum information processing, SPP-1078 (PhD position): positively evaluated and granted 2001
- Contribution to proposal to the **European Commission**, “Entanglement in Quantum Information Processing and Communication (EQUIP)” Integrating Project, 2000, M. Wilkens project leader: positively evaluated and granted 2000
- Coauthor of a proposal to the **German Research Foundation**, SPP quantum information processing, SPP-1078 (PhD position): positively evaluated and granted 1999

Teaching

- Teaching experience in **regular courses**:
 - **Advanced quantum mechanics: Quantum many-body theory**
Review of the structure of quantum mechanics, indistinguishable particles and second quantization, field operators, Fermi gases, correlation functions, systems with Coulomb interaction, bosonic systems and superfluidity, quantum fluids, superfluidity, density waves, superconductors, BCS theory, lattice systems and strongly correlated models, XY model, criticality and quantum phase transitions, free fermions and bosons, Bose-Hubbard model, disordered systems, quantum Monte Carlo, scattering theory, elements of relativistic quantum mechanics.
 - **Quantum information theory:**
What is quantum information?, concept of states and operations in quantum mechanics, distinguishing quantum states, correlations in quantum states, entanglement, distillation of entanglement, separability, quantification of entanglement, teleportation and dense coding, introduction to the theory of quantum computing, quantum algorithms with oracles: Deutsch-Jozsa, Vazirani, Shor’s algorithm, Grover’s algorithm, adiabatic quantum computing, simulating quantum systems quantum error correction, fault tolerant computing, computational models, decoherence in quantum devices, Gaussian states, semi-group formalism of open quantum systems.
 - **Advanced quantum information theory:**
Possible and impossible machines, mathematical structural foundations of quantum theory, dilation theorems, open quantum systems, quantum computation, quantum algorithms, advanced theory of open quantum systems, quantum cryptography.
 - **Advanced quantum optics:**
Laser theory, coherent interactions, atoms with many levels, adiabatic passage, electromagnetically induced transparency, laser cooling, elements of atom optics, open quantum systems, semi-group approach to open quantum systems, quantum Brownian motion, advanced techniques for the simulation of non-Markovian systems, time-convolutionless methods, phase space function, Gaussian states, Bose-Einstein condensation, superfluidity, ultra-cold atoms in optical lattices, quantum phases transitions in lattice systems, mixtures of bosonic and fermionic systems.

– **Optimization theory with applications in physics:**

Motivation of the subject of optimization theory for applications in physics, linear programming, duality for linear programs, classification of optimization problems, optimality in unconstrained problems, elements of convex analysis and separation theorems, theorem of Lagrange, constraint qualification, theorem of Kuhn and Tucker, Lagrange duality, duality gaps, semi-definite programming, relaxation methods of non-convex optimization problems, simulated annealing, agent-based optimization, genetic algorithms, reinforcement learning.

– **Seminar on modern topics in quantum optics and quantum information:**

Measurement of correlation functions for the analysis of ultrafast molecular dynamics, Förster transfer in dye-marked biomolecules, quantum metrology and imaging using entanglement, materials with negative refractive index, experimental purification of entanglement, additivity problems in quantum information theory, secure key extraction versus entanglement distillation in quantum cryptography, etc.

■ Experience in leading **seminars**

■ Extensive experience in teaching **tutorial courses**, including grading, on

- quantum information theory
- statistical physics
- classical physics
- quantum mechanics
- atomic physics
- electrodynamics
- elementary experimental methods in spectroscopy

List of publications

Jens Eisert

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Publications in high impact journals

This list comprises all those publications that have been published in

- *Physical Review Letters*
- *Nature Physics*
- *Nature*
- *Reviews of Modern Physics*
- *Communications in Mathematical Physics*

- [1] D. Gross, S. Flammia, and J. Eisert,
“Most quantum states are too entangled to be useful as computational resources”,
Physical Review Letters **102**, 190501 (2009),
(Lanl e-print arXiv:0810.4331).
- [2] D. Yang and J. Eisert,
“Entanglement combing”,
Physical Review Letters **103**, 220501 (2009),
(Lanl e-print arXiv:0907.4757).
- [3] A. Mari and J. Eisert,
“Gently modulating opto-mechanical systems”,
Physical Review Letters **103**, 213603 (2009).
(Lanl e-print arXiv:0911.0433).
- [4] J.S. Lundeen, A. Feito, H. Coldenstrodt-Ronge, K.L. Pagnell, Ch. Silberhorn, T.C. Ralph,
J. Eisert, M.B. Plenio, and I.A. Walmsley,
“Tomography of quantum detectors”,
Nature Physics **5**, 29 (2009),
(Lanl e-print arXiv:0807.2444).
- [5] D. Gross and J. Eisert,
“Supersonic quantum communication”,
Physical Review Letters **102**, 240501 (2009),
(Lanl e-print arXiv:0808.3581).
- [6] J. Eisert, M. Cramer, and M.B. Plenio,
“Area laws for the entanglement entropy”,
Reviews of Modern Physics, in press (2009),
(Lanl e-print arXiv:0808.3773).

- [7] M. Aspelmeyer and J. Eisert,
“Entangled families”,
Nature News and Views **455**, 180 (2008).
- [8] M.M. Wolf, J. Eisert, T.S. Cubitt, and J.I. Cirac,
“Assessing non-Markovian dynamics”,
Physical Review Letters **101**, 150402 (2008),
(Lanl e-print arXiv:0711.3172).
- [9] M. Cramer, A. Flesch, I.P. McCulloch, U. Schollwoeck, J. Eisert,
“Exploring local quantum many-body relaxation by atoms in optical superlattices”,
Physical Review Letters **101**, 063001 (2008),
(Lanl e-print arXiv:0805.0798).
- [10] M. Cramer, C. Dawson, J. Eisert, and T.J. Osborne,
“Quenching, relaxation, and a central limit theorem for quantum lattice systems”,
Physical Review Letters **100**, 030602 (2008),
(Lanl e-print cond-mat/0703314).
- [11] C.M. Dawson, J. Eisert, and T.J. Osborne
“Unifying simulation methods of quantum many-body systems”,
Physical Review Letters **100**, 130501 (2008),
(Lanl e-print arXiv:0705.3456).
- [12] M. Cramer, S. Ospelkaus, C. Ospelkaus, K. Bongs, K. Sengstock, and J. Eisert,
“Do mixtures of bosonic and fermionic atoms adiabatically heat up in optical lattices?”,
Physical Review Letters **100**, 140409 (2008),
(Lanl e-print arXiv:0707.3633).
- [13] K. Kieling, T. Rudolph, and J. Eisert,
“Percolation, renormalization, and quantum computing with non-deterministic gates”,
Physical Review Letters **99**, 130501 (2007),
(Lanl e-print quant-ph/0611140).
- [14] O. Gühne, P. Hyllus, O. Gittsovich, and J. Eisert,
“Covariance matrices and the separability problem”,
Physical Review Letters **99**, 130504 (2007),
(Lanl e-print quant-ph/0611282).
- [15] D. Gross and J. Eisert,
“Novel schemes for measurement-based quantum computation”,
Physical Review Letters **98**, 220503 (2007),
(Lanl e-print quant-ph/0609149).

- [16] M. Cramer, J. Eisert, and M.B. Plenio,
“Statistics dependence of the entanglement entropy”,
Physical Review Letters **98** (2007),
(Lanl e-print quant-ph/0611264).
- [17] M. Paternostro, D. Vitali, S. Gigan, M.S. Kim, C. Brukner, J. Eisert, and M. Aspelmeyer,
“Creating and probing macroscopic entanglement with light”,
Physical Review Letters **99**, 250401 (2007),
(Lanl e-print quant-ph/0609210).
- [18] J. Eisert, T. Tyc, T. Rudolph, and B. Sanders,
“Gaussian quantum marginal problem”,
Communications in Mathematical Physics **280**, 263 (2007),
(Lanl e-print quant-ph/0703225).
- [19] J. Eisert,
“Computational difficulty of global variations in the density matrix renormalization group”,
Physical Review Letters **97**, 260501 (2006),
(Lanl e-print quant-ph/0609051).
- [20] J. Eisert and T.J. Osborne,
“General entanglement scaling from time evolution”,
Physical Review Letters **97**, 150404 (2006),
(Lanl e-print quant-ph/0603114).
- [21] J. Eisert,
“Optimizing linear optics quantum gates”,
Physical Review Letters **95**, 040502 (2005),
(Lanl e-print quant-ph/0409156).
- [22] M.B. Plenio, J. Eisert, J. Dreissig, and M. Cramer,
“Entropy, entanglement, and area: analytical results for harmonic lattice systems”,
Physical Review Letters **94**, 060503 (2005),
(Lanl e-print quant-ph/0409156).
- [23] J. Eisert,
“Exact decoherence to pointer states in free open quantum systems is universal”,
Physical Review Letters **92**, 210401 (2004),
(Lanl e-print quant-ph/0311022).
- [24] J. Eisert, M.B. Plenio, S. Bose, and J. Hartley,
“Towards mechanical entanglement in nano-electromechanical devices”,
Physical Review Letters **93**, 190402 (2004),
(Lanl e-print quant-ph/0311113).

- [25] M. Cramer, J. Eisert, and F. Illuminati,
“Inhomogeneous Bose-Fermi mixtures in cubic lattices”,
Physical Review Letters, **93**, 190405 (2004),
(Lanl e-print cond-mat/0310705).
- [26] M.M. Wolf, J. Eisert, and M.B. Plenio,
“The entangling power of passive optical elements”,
Physical Review Letters **90**, 047904 (2003),
(Lanl e-print quant-ph/0206171).
- [27] K. Audenaert, M.B. Plenio, and J. Eisert,
“The entanglement cost under operations preserving the positivity of partial transpose”,
Physical Review Letters **90**, 027901 (2003),
(Lanl e-print quant-ph/0207146).
- [28] J. Eisert, S. Scheel, and M.B. Plenio,
“Distilling Gaussian states with Gaussian operations is impossible”,
Physical Review Letters **89**, 137903 (2002),
(Lanl e-print quant-ph/0204052).
- [29] J. Eisert and M.B. Plenio,
“Quantum and classical correlations in quantum Brownian motion”,
Physical Review Letters **89**, 137902 (2002),
(Lanl e-print quant-ph/0111016).
- [30] J. Eisert and M.B. Plenio,
“Conditions for the local manipulation of Gaussian states”,
Physical Review Letters **89**, 097901 (2002),
(Lanl e-print quant-ph/0109126).
- [31] J. Eisert, M. Wilkens, and M. Lewenstein,
“Reply: Quantum games and quantum strategies”,
Physical Review Letters **87**, 069802 (2001).
- [32] K. Audenaert, J. Eisert, E. Jane, M.B. Plenio, S. Virmani, and B. de Moor,
“The asymptotic relative entropy of entanglement”,
Physical Review Letters **87**, 217902 (2001),
(Lanl e-print quant-ph/9912080).
- [33] J. Eisert and M. Wilkens,
“Catalysis of entanglement manipulation for mixed states”,
Physical Review Letters **85**, 437 (2000),
(Lanl e-print quant-ph/9912080).

[34] J. Eisert, T. Felbinger, P. Papadopoulos, M.B. Plenio, and M. Wilkens, “Classical information and distillable entanglement”, *Physical Review Letters* **84**, 1611 (2000), (Lanl e-print quant-ph/9907021).

[35] J. Eisert, M. Wilkens, and M. Lewenstein, “Quantum games and quantum strategies”, *Physical Review Letters* **83**, 3077 (1999), (Lanl e-print quant-ph/9806088).

Submitted papers

[36] D. Gross, Y.-K. Liu, S.T. Flammia, S. Becker, and J. Eisert, “Quantum state tomography via compressed sensing”, submitted to *Physical Review Letters* (2009), (Lanl e-print arXiv:0909.3304).

[37] C. Pineda, T. Barthel, and J. Eisert, “Unitary circuits for strongly correlated fermions”, submitted to *Physical Review Letters* (2009), (Lanl e-print arXiv:0905.0669).

[38] T.S. Cubitt, J. Eisert, M.M. Wolf, “Deciding whether a quantum channel is Markovian is NP-hard”, submitted to *Communications in Mathematical Physics* (2009), (Lanl e-print arXiv:0908.2128).

[39] M. Ohliger, K. Kieling, and J. Eisert, “Limitations of quantum computing with Gaussian cluster states”, submitted to *New Journal of Physics* (2009).

[40] M. Cramer and J. Eisert, “A quantum central limit theorem for quantum lattice systems”, submitted to *New Journal of Physics* (2009), (Lanl e-print arXiv:0911.2475).

[41] G. Puentes, A. Feito, A. Datta, J. Eisert, M.B. Plenio, and I.A. Walmsley, “Entanglement quantification from incomplete measurements: Applications using photon-number-resolving weak homodyne detectors”, submitted to *New Journal of Physics* (2009), (Lanl e-print arxiv.org:0911.2482).

- [42] T. Barthel, C. Pineda, and J. Eisert,
“Contraction of fermionic operator circuits and the simulation of strongly correlated fermions”,
Physical Review A **80**, 042333 (2009),
(Lanl e-print arXiv:0907.3689).
- [43] R. Hübener, C. Kruszynska, L. Hartmann, W. Dür, F. Verstraete, J. Eisert, and M.B. Plenio,
“A renormalization algorithm with graph enhancement”,
Physical Review A **79**, 022317 (2009),
(Lanl e-print arXiv:0802.1211).
- [44] C.K. Burrell, J. Eisert, T.J. Osborne,
“Information propagation through quantum chains with fluctuating disorder”,
Physical Review A **80**, 052319 (2009),
(Lanl e-print arXiv:0809.4833).
- [45] K. Kieling, J.L. O’Brien, and J. Eisert,
“On photonic controlled phase gates”,
New Journal of Physics, in press (2009),
(Lanl e-print arXiv:0909.2057).
- [46] H. Coldenstrodt-Ronge, J.S. Lundeen, A. Feito, B.J. Smith, W. Mauerer, Ch. Silberhorn, J.
Eisert, M.B. Plenio, and I.A. Walmsley,
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Journal of Modern Optics **56**, 432 (2009),
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- [A15] Research highlight, IP Qubit Applications, May 2008.

- On “Entropy, entanglement, and area: analytical results for harmonic lattice systems”, *Physical Review Letters* **94**, 060503 (2005):

- [A16] ”Entanglement, entropy and area”, News headline, QIP-IRC, May 23, 2005.

- On “Towards mechanical entanglement in nano-electromechanical devices”, *Physical Review Letters* **93**, 190402 (2004):

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■ Further mentioning in the academic press:

- *MIT Technology Review*, "Leute von Morgen", 2005.
- Articles about group work after winning EURYI award in the following newspapers: *Manager Magazin*, *Berliner Zeitung*, *Potsdamer Neueste Nachrichten*, *Berlinews*, *Maerkische Allgemeine Zeitung*, *Potsdam*, *Stadt der Wissenschaft 2006*, *Sciencz Ticker*, *Eurekaalert*, *BerlinOnline*, *Pro-Physik.de*, *Interconnections.de*, *Innovations-Report*, *100Versicherungen.de*, *Physik-Journal*, *Portal*, *Uni-Protokolle*, *Deutsche Universitaetszeitung*, *Deutscher Hochschulverband Aktuell*, *About Imperial*, web pages of the *ESF*, *GermanyFG*, and the *EPSRC*.
- Television programme in German public TV channel 3SAT in "Generation Zukunft" (Generation Future), science programme "Nano", first broadcast March 2007.
- Articles about Fellowship in Institute for Advanced Study Berlin in: "Baendiger des Chaos", *Potsdamer Neueste Nachrichten*, October 2009.
- "Ueber Barrieren hinweg denken", *Portal*, Oktober 2008.
- "Prestigious EU-fellowship winner returns to Imperial", *Imperial College Web page*, September 6, 2004.
- "Ein Jubelfest fuer die Physik", *Portal*, September 2004.
- "Aus Respekt vor der Tradition der Wissenschaft", *Portal*, April 2003.

Scientific talks

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Conference talks

[T1] “Measuring Markovianity”.

Invited speaker, Mittag-Leffler conference, Stockholm, Sweden, September 2010.

[T2] “Almost frustrated quantum systems”.

Invited speaker, International Congress of Mathematics 2010, Hyderabad, India, August 2010.

[T3] “Relaxation and equilibration of quantum many-body systems”.

Invited speaker, 28th International Colloquium on Group-Theoretical Methods in Physics, Newcastle, UK, July 2010.

[T4] “Gently modulating opto-mechanical systems”.

Invited speaker, Quantum Optics 2010, St Andrews, UK, June 2010.

[T5] “Relaxation and concentration of measure”.

Invited speaker, Emergence and Entanglement, Perimeter Institute, Waterloo, Canada, May 2010.

[T6] “Concentration of measure and the foundations of statistical mechanics”.

Invited speaker, Complex quantum systems, Singapore, March 2010.

[T7] “Quantum many-body systems”.

Invited speaker, 46th Winter School of Theoretical Physics, Ladek Zdroj, Poland, February 2010.

[T8] “Tensor networks for frustration-free systems”.

Invited speaker, Workshop on Tensor Networks, Max Planck Institute for Quantum Optics, Garching, January 2010.

(Selected future invitations)

[T9] “Relaxation and concentration of measure”.

[T10] “Quantum many-body systems:

1. Area laws, hardness of simulation, and tensor networks.
2. Non-equilibrium dynamics: Relaxation and faster-than-sound quantum communication
3. Quantum computing and quantum many-body systems”.

Invited speaker, II Paraty Quantum Information School and Workshop, Paraty, Brasil, August 2009.

[T11] “Simulating fermionic systems”.

Invited speaker, Quantum Marginals and Density Matrices, Fields Institute, Toronto, Canada, July 2009.

[T12] “To measure noise and to squeeze”.

Invited speaker, Quantum Optics of Nano- and Micromechanical Systems, Heraeus Workshop, July 2009.

[T13] “Too entangled to be useful?”.

Invited speaker, 4th Feynman Festival, Olomouc, Czech Republic, June 2009.

[T14] “Measuring measurement”.

Invited speaker, CLEO/Europe-EQEC 2009, Munich, June 2009.

[T15] “Quenching, relaxation, and entanglement in systems of cold atoms in optical lattices”.

Invited speaker, International Conference on Quantum Engineering, ETH Zurich, Monte Verita, Switzerland, June 2009.

[T16] “Too entangled to be useful?”.

Invited speaker, 5th Central European Quantum Information Processing Workshop (CE-QIP09), Telc, Czech Republic, June 2009.

[T17] “Lieb-Robinson bounds”.

Quantum Information Theory Workshop, Benasque, Spain, June 2009.

[T18] “Certifying non-Markovian dynamics in opto-mechanical systems”.

Invited speaker, Central European Workshop on Quantum Optics (CEWQO 2009), Turku, Finland, May 2009.

[T19] “Quantum many-body systems:

1. Area laws and simulation
2. Non-equilibrium dynamics
3. Quantum computing”.

Invited speaker, 2009 QUROPE School, Cortona, Italy, May 2009.

[T20] “Quantum many-body systems: Quantum computation and efficient simulation”.

Invited speaker, March Meeting of the APS, Pittsburgh, USA, March 2009.

[T21] “Quantum networks”.

Invited speaker, QAP Review meeting, Gotenburg, Sweden, March 2009.

[T22] “Lieb Robinson bounds”.

A2 Meeting, Potsdam, December 2008.

[T23] “Too entangled to be useful?”.

Invited speaker, Difficult Problems in Quantum Information Theory, MIT Center for Extreme Quantum Information, Cambridge USA, November 2008.

[T24] “On the role of entanglement in quantum computing”.

Invited speaker, New Frontiers in Quantum Information Science, Heraeus Conference, November 2008.

[T25] “Almost all states are too entangled to be resources for measurement-based quantum computing”.

Tensor Networks Workshop, Madrid, October 2008.

[T26] “Perspectives of quantum information applications in optical lattices”.

Invited speaker, Quo vadis BEC? Heraeus Conference, October 2008.

[T27] “Quenching, relaxation, and a central limit theorem for quantum lattice models”.

Invited speaker, Quantum Coherence and Decoherence Workshop, Benasque, Spain, September 2008.

[T28] “Quenching and relaxation: A quantum simulation approach”.

Invited speaker, Quantum/Classical Control in Quantum Information: Theory and experiments, QUROPE Workshop, Otranto, Italy, September 2008.

[T29] “Too entangled to be useful?”.

Invited speaker, QICS Workshop on Foundational Structures for Quantum Information and Computation, Obergurgl, September 2008.

[T30] “Decoherence without environments”.

Invited speaker, Quantum Decoherence and Quantum Information Science, Lorentz Center, Leiden, August 2008.

[T31] “Quenching and relaxation in quantum lattice models”.

Invited speaker, Frontiers of Quantum and Mesoscopic Thermodynamics 2008 (FQMT’08), Prague, July 2008.

- [T32] “Quenching, non-equilibrium-dynamics, and entanglement in systems of cold atoms in optical lattices”.
- Invited speaker**, 4th Central European Quantum Information Processing Workshop (CE-QIP08), Telc, Czech Republic, June 2008.
- [T33] “New models for measurement-based quantum computing”.
- Invited speaker**, Quantum Information and Graph Theory: Emerging connections, Perimeter Institute, Waterloo, Canada, May 2008.
- [T34] “New models for measurement-based quantum computing”. QQQ Meeting, Berlin, May 2008.
- [T35] “Quenching, relaxation, and information transfer in lattice systems”.
- Invited speaker**, Classical and Quantum Information Theory, Santa Fe, New Mexico USA, March 2008.
- [T36] “Quantum circuits to describe strongly correlated lattice models”.
- Invited speaker**, Efficient classical simulation of strong correlated systems, workshop, Frühjahrstagung of the German Physical Society, Berlin, February 2008.
- [T37] “Quantum networks”.
- Invited speaker**, QAP Review meeting, Paris, February 2008.
- [T38] “New ideas of quantum computing with measurements”.
- Invited speaker**, Theoretical Quantum Computation Workshop 2008 (TQC08), Tokyo, February 2008.
- [T39] “Decoherence without environments, decoherence without time evolution”.
- Invited speaker**, Quantum Systems Workshop Conference, KU Lueven, Belgium, December 2007.
- [T40] “Flow approach to the simulation of quantum many-body systems”.
- Invited speaker**, Quantum control and quantum many-body systems, Garching, Germany, October 2007.
- [T41] “Decoherence without heat baths”.
- Invited speaker**, Quantum Mechanics: Foundations and Open Systems, Turku, Finland, October 2007.
- [T42] “Quantum computing by measurements”.
- Invited speaker**, Photons, Atoms and Qubits, London, UK, September 2007.

- [T43] “Computer science of many-body systems”.
Invited speaker, keynote speaker, Computational Complexity of Quantum Hamiltonian Systems, Leiden, Belgium, July 2007.
- [T44] “Relaxation and randomness”.
Invited speaker, International Workshop on Randomization in Quantum Systems, Waterloo, Canada, June 2007.
- [T45] “Entanglement theory”.
Invited speaker, Benasque Workshop on Quantum Information, Benasque, Spain, June 2007.
- [T46] “Squeezing and entanglement”.
Invited speaker, International Conference on Squeezed States and Uncertainty Relations, Bradford, UK, April 2007.
- [T47] “Quantum effects in mesoscopic devices”.
Invited speaker, International Conference on Continuous-Variable Quantum Information Processing, St Andrews, UK, April 2007.
- [T48] “Quantum information and many-body systems”.
Invited speaker, Quantum Information and Many-Body Quantum Systems, Pisa, Italy, March 2007.
- [T49] “Quantum networks”.
Invited speaker, QAP Review meeting, Oxford, February 2007.
- [T50] “Lieb Robinson bounds in many-body systems”.
Invited speaker, International workshop on Lieb Robinson bounds, Erwin Schrödinger Institute for Mathematical Physics, Wien, Austria, February 2007.
- [T51] “Entanglement and area”.
Invited speaker, Snowbird Meeting, Utah, USA, January 2007.
- [T52] “Computational potency of many-body systems”.
Invited speaker, International Mathematical Physics Days, Leuven, Belgium, September 2006.
- [T53] “Entanglement in many-body systems”.
Invited speaker, Feynman Festival, Maryland, USA, August 2006.
- [T54] “Entanglement, area, and the difficulty of finding ground states of many-body systems”.
QUOXIC, London, August 2006.

- [T55] “If we calculate ground states, how much paper do we need?”,
Invited speaker, “Cats, Kets and Cloisters”, International workshop, Oxford, July 2006.
- [T56] “Complexity of describing many-body system”.
Invited speaker, German-American Frontiers of Science Symposium, Humboldt Foundation, Potsdam, June 2006.
- [T57] “Quantum-classical transition and quantum information”.
Invited speaker, International workshop on quantum-classical transition and quantum information, Benasque, Spain, June 2006.
- [T58] “Complexity of many-body systems”.
Invited speaker, Workshop on theory and technology in quantum information, communication, computation, and cryptography, Trieste, Italy, June 2006.
- [T59] “Minimal resources for linear optical one-way computing”.
Invited speaker, International Conference on Quantum Optics, Minsk, Belarus, May 2006.
- [T60] “Estimating entanglement in Gaussian and non-Gaussian states”.
Invited speaker, International Conference on Continuous-Variable Quantum Information Processing, Copenhagen, Denmark, May 2006.
- [T61] “Criticality, gaps, and the simulation of many-body systems”.
Invited speaker, EPSRC meeting, Loughborough, UK, May 2006.
- [T62] “Entropy-area laws in critical bosonic systems”.
Invited speaker, Symposium on the simulation of many-body systems, IQOQI, Innsbruck, Austria, May 2006.
- [T63] “Ultimate limits of linear optical computing”.
Invited speaker, “International workshop on linear optical quantum information processing”, Baton Rouge, USA, April 2006.
- [T64] “Classical complexity of DMRG”.
Invited speaker, International workshop: “Quantum Information Theory”, Sydney, Australien, February 2006.
- [T65] “Perspectives of optical quantum state manipulation”.
Invited speaker, QAP, kick off meeting, Paris, February 2006.
- [T66] “Bound entangled states with a non-positive partial transpose do exist”.
International workshop: “Quantum Information Processing 2006.”, Paris, January 2006.

- [T67] “Quantum information approach to decoherence theory”.
Invited speaker, International workshop: “Open Quantum Systems”, Cuernavaca, Mexico, December 2005.
- [T68] “Efficiently simulating many body systems”.
Invited speaker, International workshop: “Minerva”, Eilat, Israel, October 2005.
- [T69] “Linear optics quantum gates”.
Invited speaker, International workshop: “SPIE Photonics”, San Diego, USA, August 2005.
- [T70] “Entanglement in quantum many-body systems”.
Invited speaker, “International Workshop on Quantum Information Theory”, York, England, July 2005.
- [T71] “Entanglement area theorems”.
Invited speaker, “Benasque: Quantum Information”, Benasque, Spain, June 2005.
- [T72] “Optimizing linear optics quantum gates’.
Invited speaker, “Abschlusskolloquium QIV”, Bad-Honnef, June 2005.
- [T73] “Optimizing linear optics quantum gates’.
March meeting of the German Physical Society (quantum optics), Berlin, March 2005.
- [T74] “Linear optics meets convex optimization”.
Invited speaker, International workshop: “Quiprolo II”, Bristol, England, March 2005.
- [T75] “Entanglement and area”.
Invited speaker, International workshop: “3rd Asia Pacific Workshop on Quantum Information Science - APWQIS - 3 “, Singapore, January 2005.
- [T76] “Harmonic graph states”.
Invited speaker, “International workshop on graph states”, Innsbruck, December 2004.
- [T77] “Optimizing success probabilities of linear optics quantum gates”.
Invited speaker, Fourth International Workshop: “Classical and Quantum Interference”, Olomouc, Tschechien, October 2004.
- [T78] “Decoherence and quantum noise”.
Invited speaker, Stochastic Resonance: New Horizons in Physics and Engineering, Dresden, Max Planck Institute for Complex Systems, October 2004.

- [T79] “Non-adiabatic generation of long-range correlations in many-body systems”.
Invited speaker, International Workshop on Entanglement and Transfer of Quantum Information, Department of Applied Mathematics and Theoretical Physics, Cambridge, UK, September-October 2004.
- [T80] “Geometric entropy in free scalar fields”.
Fifth International QIPC Workshop, Rom, Italy, September 2004.
- [T81] “Exact decoherence in open quantum systems is generic”.
Invited speaker, Control of Quantum Coherence, International WE Heraeus seminar, Bad Honnef, July 2004.
- [T82] “Manipulating continuous-variable entanglement with linear optics”.
Invited speaker, ICQO 2004, international conference on quantum optics, Minsk, Belarus, May 2004.
- [T83] “Towards mechanical entanglement in nano-electromechanical systems”.
Invited speaker, International SPIE Conference, Gran Canaria, Spain, May 2004.
- [T84] “Entanglement in infinite-dimensional quantum systems”.
Invited speaker, International DFG Workshop Hirschegg 2004. on Quantum Entanglement, Hirschegg, March 2004.
- [T85] “The few and the many”.
Invited speaker, CVQIP, International ESF conference on continuous-variable quantum information, Veilbronn, April 2004.
- [T86] “Exact decoherence in open quantum systems is generic”.
March meeting of the German Physical Society (quantum optics), Munich, March 2004.
- [T87] “Multi-particle entanglement in graph states”.
March meeting of the German Physical Society (quantum optics), Munich, March 2004.
- [T88] “From reversibility to irreversibility in quantum state transformations and back again”.
Invited speaker, TOE, International workshop on thermodynamics of entanglement, Cambridge, UK, Department of Applied Mathematics and Theoretical Physics, March 2004.
- [T89] “Non-adiabatically generated entanglement in nanomechanical resonators”.
March meeting of the German Physical Society (statistical physics), Regensburg, March 2004.

- [T90] “Exact decoherence in open quantum systems is generic”.
March meeting of the German Physical Society (statistical physics), Regensburg, March 2004.
- [T91] “Entanglement in systems with canonical coordinates”.
Invited speaker, Kolloquium des DFG-Schwerpunktprogramms Quanteninformationsverarbeitung, Bad Honnef, January 2004.
- [T92] “Optimally estimating properties of Gaussian states”.
Invited speaker, Third International Workshop: “Classical and Quantum Interference”, Olomouc, Tschechien, October 2003.
- [T93] “Secure quantum cryptography with all-optical means”.
QIPC Meeting, Oxford, UK, July 2003.
- [T94] “Entanglement of the harmonic chain”.
Invited speaker, A2 meeting, April 2003.
- [T95] “Secure quantum cryptography with all-optical means”.
Invited speaker, “2nd continuous variables quantum information processing conference”, Aix-en-Provence, Frankreich, April 2003.
- [T96] “From reversibility to irreversibility and back again: on asymptotic entanglement transformations in quantum mechanics”.
March meeting of the German Physical Society (quantum optics), Hannover, 2003.
- [T97] “State transformations for pure Gaussian states”.
March meeting of the German Physical Society (quantum optics), Hannover, 2003.
- [T98] “Feasible quantum cryptography over large distances”.
March meeting of the German Physical Society (quantum optics), Hannover, 2003.
- [T99] “Quantum Information with quantum systems with canonical coordinates”.
Invited speaker, “General theory of information transfer and combinatorics”, Bielefeld, November 2002.
- [T100] “Quantum and classical correlations in quantum Brownian motion”.
Invited speaker, “Branes, gravity, condensed matter, and non-linear quantum mechanics: new interfaces”, London, UK, September 2002.
- [T101] “Quantum and classical correlations in quantum Brownian motion”.
Invited speaker, “Quantum composite systems 2002”, Ustron, Poland, September 2002.

[T102] “Four stories on Gaussian quantum states”.

Invited speaker, “International conference on quantum information”, Oviedo, Spain, July 2002.

[T103] “Feasible manipulation of Gaussian states”.

Invited speaker, “Continuous-variable quantum information processing”, Brüssel, Belgium, April 2002.

[T104] “Quantum Brownian motion without quantum correlations”.

March meeting of the German Physical Society (statistical physics), Regensburg, 2002.

[T105] “Conditions for the local manipulation of Gaussian quantum states”.

March meeting of the German Physical Society (quantum optics), Osnabrück, 2002.

[T106] “Quantification of entanglement in infinite-dimensional quantum systems”.

March meeting of the German Physical Society (quantum optics), Osnabrück, 2002.

[T107] “Criteria for the local manipulation of Gaussian quantum states”.

Invited speaker, “Quantum Entropies: Dynamics and Information”, Trieste, Italy, December 2001.

[T108] “State manipulation of Gaussian quantum states”. IQING-meeting, informal quantum information gathering, London, October 2001.

[T109] “Gaussian quantum states”.

Invited speaker, A2 meeting, Universität Braunschweig, November 2001.

[T110] “The asymptotic relative entropy of entanglement”.

Invited speaker, “Quantum Information: Theory, Experiment and Perspectives”, Gdansk, Poland, July 2001.

[T111] “Manipulation of quantum states”.

Invited speaker, “Theory of quantum gases and quantum coherence”, Salerno, Italy, June 2001.

[T112] “Regularized relative entropy of entanglement”.

March meeting of the German Physical Society (quantum optics), Berlin, 2001.

[T113] “On the irreversibility of asymptotic state manipulation”.

A2 meeting, Braunschweig, November 2000.

- [T114] "Entanglement-assisted local quantum operations".
Benasque Center for Science, Benasque, Spain, July 2000.
- [T115] Project presentation, DFG, Bad Honnef, Januar 2001.
- [T116] "Catalysis of entanglement manipulation for mixed states".
March meeting of the German Physical Society (quantum optics), Bonn, 2000.
- [T117] "Quanteninformation und Spieltheorie".
March meeting of the German Physical Society (quantum optics), Bonn, 2000.
- [T118] "Klassische Information und destillierbare Verschränkung".
March meeting of the German Physical Society (quantum optics), Bonn, 2000.
- [T119] "Catalysis of state transformations".
A2 meeting, Braunschweig, November 1999.
- [T120] "Loss of classical information and entanglement".
A2 meeting, Magdeburg, April 1999.
- [T121] "Quantum games and quantum strategies".
March meeting of the German Physical Society (quantum optics), Heidelberg, 1999.
- [T122] "Distillable entanglement and classical information".
A2 meeting, Braunschweig, February 1999.
- [T123] "On the additivity of entanglement measures".
A2 meeting, Potsdam, November 1998.
- [T124] "Quantum Brownian motion".
March meeting of the German Physical Society (statistical physics), Münster, 1997.

- [C1] “Quantenrechnen nur durch Auslesen”.
Invited speaker (O. Benson), Colloquium Humboldt University Berlin, October 2009.
- [C2] “Quantenrechnen ohne Rechnen”.
Invited speaker (G. Alber), Colloquium Universität Darmstadt, June 2009.
- [C3] “Relaxation in non-equilibrium dynamics of cold atoms in optical lattices”.
Invited speaker (J. von Delft), Condensed Matter Colloquium Ludwigs-Maximilians-Universität Munich, February 2009.
- [C4] “Simulation von Quanten-Vielteilchensystemen”.
Invited speaker (G. Schön), seminar, Universität Karlsruhe, August 2007.
- [C5] “Komplexität von Quanten-Vielteilchensystemen”.
Invited speaker (A. Rüdiger), seminar, Universität Konstanz, June 2007.
- [C6] “Computational potency of quantum many-body systems”.
Invited speaker (A. Winter), seminar, Bristol, University of Bristol, England, May 2007.
- [C7] “Novel models for quantum computing”.
Invited speaker (A. Ekert), seminar, DAMPT, University of Cambridge, England, February 2007.
- [C8] “Simulation von Vielteilchensystemen: Eine Perspektive der Quanteninformation”.
Invited speaker (W. Zimmermann), colloquium, Fakultät für Physik, Universität Bayreuth, December 2006.
- [C9] “Quantum optics komplexer Systeme”.
Invited speaker (H.W. Diehl), colloquium, Fakultät für Physik, Universität Essen-Duisburg, December 2006.
- [C10] “Simulating many-body systems”.
Invited speaker (J.P. Keating), seminar, Fakultät für Physik, University of Bristol, November 2006.
- [C11] “Complexity of quantum systems”.
Invited speaker (A. Fring), seminar, Fakultät für Mathematik, City University of London, November 2006.
- [C12] “Complex quantum systems”.
Invited speaker (G. Wunner), colloquium, Fakultät für Physik, Universität Stuttgart, July 2006.

- [C13] “Three short stories on quantum information science”.
Invited speaker (A. Zeilinger), colloquium, Fakultät für Physik, Universität Wien, May 2006.
- [C14] “Three short stories on quantum information science”.
Invited speaker (A. Zeilinger), colloquium, Fakultät für Physik, Universität Wien, May 2006.
- [C15] “Computer science perspective on linear optical computing”.
Invited speaker (S. Abramski), colloquium, Fakultät für Informatik, Oxford, UK, February 2006.
- [C16] “Drei Geschichten zu Verschränkung, Kohärenz und Dekohärenz”.
Invited speaker (F. Schmidt-Kaler), colloquium, Symposium Quanten-Information, Universität Ulm, December 2006.
- [C17] “Linear optics quantum gates”.
Invited speaker (G. Mahler), Theorieseminar, Stuttgart, November 2005.
- [C18] “Optimally preparing linear optics cluster states”.
Invited speaker (H.J. Briegel), Theorieseminar, Innsbruck, October 2005.
- [C19] “Single-copy entanglement in critical quantum systems”.
Invited speaker (J.I. Latorre), seminar, Condensed matter group, Barcelona, Spain, September 2005.
- [C20] “Entanglement in many-body systems”.
Invited speaker (D. Gottesman), seminar, Perimeter Institute, August 2005.
- [C21] “Quantum information and global optimization”.
Invited speaker (D. Gottesman), seminar, Perimeter Institute, August 2005.
- [C22] “Convex optimization meets quantum information”.
Invited speaker (A. Ekert), seminar, Quantum Information Group, Cambridge, UK, February 2005.
- [C23] “Convex optimization meets quantum information”.
Invited speaker (A. Ekert), seminar, Quantum Information Group, Cambridge, UK, February 2005.
- [C24] “Complex quantum systems”.
Invited speaker (J. Schmiedmayer), colloquium, Universität Heidelberg, January 2005.
- [C25] “Estimating properties of states of light”.
Invited speaker (I.A. Walmsley), seminar, Quantum Optics Group, Oxford, UK, May 2004.

- [C26] “Generic exact decoherence in open quantum systems”.
Invited speaker (H.J. Briegel), seminar, Quantum Optics Group, Innsbruck, May 2004.
- [C27] “Manipulating entangled quantum states of light”.
Invited speaker (M. Fleischhauer), Kolloquium anlässlich einer Vorstellung für eine C4-Professur für Quantum optics, Kaiserslautern, January 2004.
- [C28] “Estimating entanglement and squeezing”.
Invited speaker (U. Leonhardt), colloquium, University of St Andrews, December 2003.
- [C29] “Continuous-variable entanglement”.
Invited speaker (M.S. Kim), colloquium, Department of Quantum Optics, Queen’s University, Belfast, September 2003.
- [C30] “Continuous-variable entanglement”.
Invited speaker (H.J. Briegel), seminar, Ludwig-Maximilians-Universität Munich, June 2003.
- [C31] “Feasible quantum privacy amplification”.
Invited speaker (M. Fleischhauer), seminar, Universität Kaiserslautern, May 2003.
- [C32] “Feasible quantum privacy amplification”.
Invited speaker (R. Schack), seminar, Department of Mathematics, Royal Holloway College, London, February 2003.
- [C33] “How to distill entanglement with optical elements and photon detectors only”.
Invited speaker (I.A. Walmsley), seminar, Quantum Optics Group, Oxford, February 2003.
- [C34] “The story of the preparation and distribution of entangled continuous-variable states over large distances”.
Invited speaker (J. Preskill), seminar, Quantum Optics and Quantum Information Group, CalTech, January 2003.
- [C35] “Quantum information science”.
Invited speaker (H. Loschelder), award speech for Michelson Price, June 2002.
- [C36] “News from the Gaussian world”.
Invited speaker (Christoph Simon), Seminar in Oxford, Centre for Quantum Computation, June 2002.
- [C37] “A no-go-theorem for the feasible distillation of Gaussian states”.
Invited speaker (Hans Briegel), Seminar der Arbeitsgruppe für Quantum optics, Ludwig-Maximilians-Universität Munich, March 2002.
- [C38] “Gaussian quantum states: manipulation and distillation”.
Invited speaker (Ed Hinds), Seminar der Arbeitsgruppe für Quantum optics, University of Sussex, Brighton, February 2002.

[C39] “State transformations for continuous variables”.

Invited speaker (Vlatko Vedral), seminar, QOLS, Imperial College, January 2002.

[C40] “Manipulation of Gaussian quantum states”.

Invited speaker (Hans Briegel), Seminar der Arbeitsgruppe für Quantum optics, Ludwig-Maximilians-Universität Munich, December 2001.

[C41] “Quantum computing”.

Invited speaker (Christos Panos), Seminar der Arbeitsgruppe für Quantentheorie, Universität von Thessaloniki, December 2001.

[C42] “Asymptotic relative entropy of entanglement”.

Invited speaker (Christoph Simon), Seminar in Oxford, Centre for Quantum Computation, April 2001.

[C43] “Quantum information and game theory”.

Invited speaker (Hans Briegel), Seminar der Arbeitsgruppe für Quantum optics, Ludwig-Maximilians-Universität Munich, June 2000.

[C44] “Teleportation and Dense Coding”.

(Martin Wilkens, Jürgen Kurths), Seminar über theoretische Physik, Potsdam, April 1999.

[C45] “Decoherence and the appearance of a classical world in quantum theory”.

Seminar über theoretische Physik, Potsdam, April 1998.

[C46] “Quantum Brownian Motion”.

Seminar über Quantenstochastik, Freiburg, February 1998.