CURRICULUM VITAE

Jens Eisert
Professor of Theoretical Physics

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PERSONAL DETAILS

- **Date of birth:** 9th of October 1970
- **Nationalities:** German and Swedish
- **Marital status:** Married

ACADEMIC APPOINTMENTS

5/11-	**Full Professor**, Dahlem Center for Complex Quantum Systems, **Freie Universität Berlin**
10/09-09/10	**Fellow** at the **Institute for Advanced Study Berlin** (Wissenschaftskolleg)
5/08-4/11	**Full Professor**, **University of Potsdam**
03/05-5/08	**Lecturer** (permanent), Institute for Mathematical Sciences, **Imperial College London**
12/02-03/05	**Junior Professor**, Quantum Optics and Quantum Information, **University of Potsdam**
12/02-01/03	**Visiting Scholar**, IQI, **California Institute of Technology**
07/01-11/02	**Feodor Lynen Fellow** in QOLS, **Imperial College London**
02/01-07/01	**Postdoctoral researcher** in QOLS, **Imperial College London**, supported by the EU

RESEARCH

Research interests: Quantum many-body theory, quantum information, quantum optics

- Entanglement theory
- Non-equilibrium dynamics of strongly correlated quantum systems
- Tensor networks descriptions and simulation of condensed-matter systems
- Quantum computation and information
- Quantum optical implementations of quantum information ideas
- Ultra-cold atomic gases in optical lattices
- Decoherence and opto-mechanical systems

Research talks:

- >**200 invited talks** at workshops, conferences, and in colloquia

Publications:

- **144** scientific publications, of which
- **50** published in the *Phys. Rev. Lett.*
- **2** in *Nature Physics*, **1** in *Nature* NaV,
- **3** in the *Commun. Math. Phys.*

Citations:

- **6.179 citations** according to Web of Science (WoS)
- **10.002 citations** according to Google Scholar (GS)
- **h-index 52** (GS), **42** (WoS)
- **31 publications** with >100 citations (GS)

AWARDS AND PRIZES

- **ERC Consolidator Award** of the European Research Council, 2012
- **Institute for Advanced Study Berlin** Fellow, 2010-2011
- **European Research Young Investigator** (EURYI) Award, 2004
- **Feodor Lynen** Scholarship of the **Alexander von Humboldt Foundation**, 2001
- **Michelson Prize**, 1998
- **J. W. Fulbright** Scholarship, 1994

MENTIONING IN THE ACADEMIC PRESS AND PUBLIC OUTREACH

- Regular reporting of work in scientific journals: *Nature*, *New Scientist*, *Scientific American*, *Physics News*, *PhysOrg*, *Physics*, *QIP-IRC*, *Quantum Times*, *Complexity digest*, *IST-web page* of the EC, *Science week*, *MIT Technology Review*, *Physics World*, and others
- Coverage of work in *BBC Radio 4*, the *3SAT* science TV channel

PHD

04/98-01/01 **PhD, University of Potsdam**, thesis advisor M. Wilkens,
"Entanglement in Quantum Information Theory"
Final grade: **Summa cum laude** (highest distinction)

EDUCATION

95-98, 91-94 **Albert Ludwigs University Freiburg**, 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"*

94–95 **University of Connecticut**, as a J. W. Fulbright Fellow,
postgraduate studies in mathematics and physics
Degree: **Master of Science**, GPA: **3.88** (grading scale: A–4.0, . . . , D –1.0)
Scientific work in applied mathematics/numerical analysis

81–90 **Wilhelm-von-Humboldt**-High-School, Ludwigshafen
Degree: **Abitur**, average mark: **1.0** (grading scale: 1.0, 1.1, 1.2, . . . , 4.0)

RESEARCH FUNDING

- **European Research Council:** ERC Consolidator Award, *"Taming non-equilibrium quantum systems"* (2012)
- **FQXI:** Large grant, *"Decidable and undecidable in quantum physics"* (2013)
- **Research Councils of Europe:** EURYI Award (later renamed ERC Starting Grant), *"Multi-particle entanglement in complex quantum systems"* (2004),
- **European Commission (integrated projects):** IP SIQS (2012, quantum simulation), IP QESSENCE (2010, optical quantum information and metrology), IP QAP (2005, quantum information science), the latter two in co-managing position as subproject leader, IP QUIPROCONE (2000, quantum information)
- **European Commission (FET Open):** Strep MINOS (2008, opto-mechanical systems), Strep COMPAS (2008, continuous variable quantum information)
- **German Ministry for Research (BMBF):** QuOReP (2010, quantum optical quantum repeater architectures)
- **German Research Foundation (DFG):** SPP-1116 (2004, physics of ultra-cold atoms), SPP-1078 (1999, quantum information theory)
- **Microsoft research:** Project on linear optical quantum computing (2006)
- **EPSRC:** Project on quantum optical quantum information processing (2004)
- **Alexander-von-Humboldt Foundation:** Feodor-Lynen Scholarship (2001); hosted Markus Aspelmeyer (Bessel programme), Tomaz Prosen (Bessel programme), Michael James Kastoryano (scholarship)
- **DLR:** COST project (2012, thermodynamics on the nano-scale)

EDITORIAL BOARD MEMBERSHIPS AND SERVICES TO THE COMMUNITY

- *Annals of Physics*
- *Physical Review A* (term 2008-2010)
- *Journal of Physics A*
- *Quantum Information Processing*
- *Quantum Information and Computation*
- Coauthor and lead theory editor of the *2010 road map for quantum information science* of the EU
- Editor of the *Handbook of Quantum Technologies*, planned major European book project

ORGANISATIONAL 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)
- **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
- **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
- **Member of many conference scientific boards**
- **IQING 2002**, organizer of an international conference for PhD students and postdocs on quantum information science in theory and experiment
- **IQING 2001**, jointly with C. Simon (Oxford) and Jonathan (Cambridge), 2001
- **YAO '99 – Young Atom Opticians**, jointly with T. Felbinger and C. Henkel (Potsdam), 1999
- **A2-Consortium For Quantum Information**, 1998 – 2001, 2003

GROUP LEADING SKILLS AND SUPPORT OF YOUNG SCIENTISTS

- **Diploma and MSc supervision:** Benjamin Bach, Carina Prunkl, Henrik Wilming, Moritz von Hase, Adrian Steffens, Jonas Hoersch, Mathis Friesdorf, Alexander Kegeles, Holger Bernigau, Inka Benthin, Janet Anders, David Gross, Axel Friedenauer
- **PhD supervision:** Janina Gertis, Christian Gogolin, Martin Kliesch, Anna Wegloop, Mathis Friesdorf, Andrea Mari, Matthias Ohliger, Marcus Cramer, David Gross, Konrad Kieling, Fernando Brandao, Alvaro Feito (the latter two in co-supervision)
- **Postdoctoral researchers:** Earl Campbell, Thomas Barthel, Carlos Riofrio, Michael James Kastoryano, Carlos Pineda, Arnau Riera, Vincent Nesme, Robert Hübener, Niel de Beaudrap, Markus Müller, Dong Yang, Phil Hyllus, Chris Dawson, Marcus Cramer, Kenny Pregnell (co-supervised)
- **Host of Humboldt-Bessel-award winners:** Markus Aspelmeyer, Tomaz Prosen

TEACHING

- Advanced quantum mechanics
- Elementary quantum mechanics
- Statistical physics
- Quantum information theory
- Taming quantum many-body systems
- Advanced quantum information theory
- Mathematical methods

SELECTED PUBLICATIONS

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SELECTED PUBLICATIONS

This list presents a selection of 10 publications, in accordance with the guidelines of the DFG.

[1] “Probing the relaxation towards equilibrium in an isolated strongly correlated 1D Bose gas”, S. Trotzky, Y.-A. Chen, A. Flesch, I. P. McCulloch, U. Schollwöck, J. Eisert, and I. Bloch, *Nature Physics* **8**, 325 (2012),

(Lanl e-print arXiv:1101.2659).

[2] “Quantum measurement occurrence is undecidable”, J. Eisert, M. P. Mueller, and C. Gogolin, *Physical Review Letters* **108**, 260501 (2012),

(Lanl e-print arXiv:1111.3965).

[3] “Absence of thermalization in non-integrable systems”, C. Gogolin, M. P. Mueller, and J. Eisert, *Physical Review Letters* **106**, 040401 (2011),

(Lanl e-print arXiv:1009.2493).

[4] “Quantum state tomography via compressed sensing”, D. Gross, Y.-K. Liu, S.T. Flammia, S. Becker, and J. Eisert, *Physical Review Letters* **105**, 150401 (2010),

(Lanl e-print arXiv:0909.3304).

[5] “Area laws for the entanglement entropy”, J. Eisert, M. Cramer, and M. B. Plenio, *Reviews of Modern Physics* **82**, 277 (2010),

(Lanl e-print arXiv:0808.3773).

[6] “Most quantum states are too entangled to be useful as computational resources”, D. Gross, S. Flammia, and J. Eisert, *Physical Review Letters* **102**, 190501 (2009),

(Lanl e-print arXiv:0810.4331).

[7] “Tomography of quantum detectors”, J. S. Lundeen, A. Feito, H. Coldenstrodt-Ronge, K. L. Pregnell, Ch. Silberhorn, T. C. Ralph, J. Eisert, M. B. Plenio, and I. A. Walmsley, *Nature Physics* **5**, 29 (2009),

(Lanl e-print arXiv:0807.2444).

[8] “Quenching, relaxation, and a central limit theorem for quantum lattice systems”, M. Cramer, C. Dawson, J. Eisert, and T. J. Osborne, *Physical Review Letters* **100**, 030602 (2008),

(Lanl e-print cond-mat/0703314).

[9] “Novel schemes for measurement-based quantum computation”,
D. Gross and J. Eisert,
Physical Review Letters **98**, 220503 (2007),
(Lanl e-print quant-ph/0609149).

[10] “Distilling Gaussian states with Gaussian operations is impossible”,
J. Eisert, S. Scheel, and M. B. Plenio,
Physical Review Letters **89**, 137903 (2002),
(Lanl e-print quant-ph/0204052).