

## Invited Talks at Conferences and Workshops

Quantum Technology International Conference QTECH2018 (Plenary talk)

*Learning and artificial intelligence in the quantum domain*

Paris, France, 5.-7.9.2018.

<http://premc.org/conferences/qtech-quantum-technology>

Workshop on Decision Theory and the Future of Artificial Intelligence

*Understanding the decisions of intelligent learning agents*

Munich, Germany, 26.-28.7.2018.

<http://www.decision-ai.org/2018/>.

International Workshop on Machine Learning and Physics

*Projective simulation for machine-generated design of quantum experiments*

Tsinghua University, Beijing, 4.-6.7.2018.

<http://mlphys2018.csp.escience.cn>

4<sup>th</sup> Seefeld workshop on Quantum Information

*Learning agents and quantum foundations*

Seefeld Tyrol, Austria, 1.-6.6.2018.

<https://www.uibk.ac.at/th-physik/qi-seefeld2018/>

Workshop der Heisenberg Gesellschaft "Quantenphysik an der Schule"

*Quanteninformation und Verschränkung*

Weilburg, Deutschland 23.6.2018.

<http://www.heisenberg-gesellschaft.de/aktuelles/5-workshop-zur-quantenphysik-an-der-schule>

Conference on Algorithmic Information, Induction, and Observers in Physics (cancelled)

*Why Physics should care about agency.*

Perimeter Institute, Canada, 9.-13.4.2018.

<https://perimeterinstitute.ca/conferences/algorithmic-information-induction-and-observers-physics>

Quantum Machine Learning & Biomimetic Quantum Technologies (Plenary talk)

*Learning and artificial intelligence in the quantum domain*

Bilbao, Spain, 19.-23.03.2018

82. Jahrestagung der DPG und DPG-Frühjahrstagung (Plenary talk)

*Learning and artificial intelligence in the quantum domain*

Erlangen, Germany, 4.3.2018 - 9.3.2018

Quantum Information Technologies: Challenges and Applications

*Quantum learning agents*

Edinburgh, United Kingdom, 30.-31.10.2017

14<sup>th</sup> Granada Seminar on Computational and Statistical Physics

*Projective Simulation for learning and agency*

Granada, Spain, 20.-23.06.2017

Workshop on Participatory Realism  
*The view from nowhere. Why physics should care about agency*  
Stellenbosch, South Africa, 06.-08.06.2017

SANDU - Surprising AND Unexpected Paradoxes Of Physics Enable SCientific Understanding  
*Projective Simulation for learning and agency*  
Crisan, Danube Delta, Romania, 22.-26.05.2017

Winterschool on Quantum Networks  
*Projective Simulation for learning and agency*  
Obergurgl, Austria, 02.-07.04.2017

Conference on Agency and (quantum) physics  
*Introduction to agency and (quantum) physics*  
Konstanz, Germany, 20.-23.09.2016

Quantum Machine Learning Workshop (QML)  
*Projective simulation for learning and agency*  
Palm Dune Beach Lodge, KwaZulu-Natal, South Africa, 18.-22.07.2016

Workshop on Semantic Spaces at the Intersection of NLP, Physics and Cognitive Science  
*Projective Simulation for Learning and Agency*  
University of Strathclyde, Glasgow, United Kingdom, 11.06.2016

GDR IQFA 6th Colloquium  
*Quantum computation and learning*  
Institut d'Optique Graduate School, Palaiseau, France, 18.-20.11.2015

Causality in a Quantum World  
*Agency and (Quantum) Physics*  
Sunshine Coast, Australia, 16.-21.08.2015

10<sup>th</sup> International Conference on Soft Computing Models in Industrial and Environmental Applications (Plenary talk)  
*Quantum physics meets artificial intelligence*  
Burgos, Spain, 15.-17.06.2015

Quantum Theory: from foundations to technologies – QTFT  
*Agency in QBism*  
Linnaeus University, Växjö, Sweden, 08.-11.06.2015

Kick-off workshop on Agency and (quantum) physics (AQP2015)  
*Projective simulation as a physical model for agency*  
Innsbruck, Austria, 29.03.-02.04.2015

Quantum Computation, Quantum Information, and the Exact Sciences  
*Towards quantum artificial intelligence*  
LMU, Munich, Germany, 30.-31.01.2015

Seventh International Workshop DICE2014: Spacetime - Matter - Quantum Mechanics  
*Projective simulation for artificial intelligence*  
Castiglioncello, Italy, 15.-19.09.2014

10-Year Anniversary IQOQI Vienna  
*Panel discussion: What are "clouds on the horizon" of today's physics? Guests: Carlo Rovelli, Hans Briegel, Daniel Greenberger and Anton Zeilinger*  
IQOQI Vienna, Austria, 07.-08.07.2014

2<sup>nd</sup> Seefeld workshop on Quantum Information  
*Projective simulation for learning agents*  
Seefeld, Austria, 29.06.-04.07.2014

Entanglement and Speed-up: Philosophical Issues in Quantum Computing.  
*Entanglement and speed-up in measurement-based quantum computation*  
Stuttgart, Germany, 09.05.2014

Berge Fest: "In celebration of B.G. Englert's contributions to Quantum Information, Quantum Optics, and the Foundations of Quantum Mechanics."  
*Towards quantum artificial intelligence*  
CQT National University of Singapore, Singapore, 22.-26.04.2014

The Power of Information Conference 2014  
*Agency and Quantum Physics*  
St. Anne's College, Oxford, United Kingdom, 26.-29.03.2014

Öffentliche Gesamtsitzung der ÖAW: Ist unsere Zukunft vorhersehbar?  
*Quantenmechanik vs. Himmelsmechanik – Wie offen ist unsere Zukunft?*  
ÖAW, Wien, Austria, 14.11.2013

QuEBS 2013: Quantum Effects in Biological Systems Workshop  
*Projective simulation as a model for learning*  
IMBA Vienna, Austria, 29.06. - 03.07.2013

International Research Conference "Q-Start: Physics, Computer Science and Mathematics - Thoughts on Quantum Information"  
*Quantum Agents, Simulation and Biology*  
The Hebrew University of Jerusalem, Israel, 24.06. - 27.06.2013

Quantum Physics Meets the Philosophy of Mind  
*On Agency and Freedom Under the Laws of Nature*  
Catholic University of the Sacred Heart, Milan, Italy, 04.-06.06.2013

Kavli Institute for Theoretical Physics (KITP) Program: Control of Complex Quantum Systems  
*Quantum Agents, Simulation, and Biology*  
University of California, Santa Barbara, USA, 07.01. – 28.03.2013

Kavli Institute for Theoretical Physics (KITP) Program: Control of Complex Quantum Systems  
*Projective Simulation for Classical and Quantum Autonomous Agents*  
University of California, Santa Barbara, USA, 07.01. – 28.03.2013

62. Jahrestagung 2012 der Österreichischen Physikalischen Gesellschaft (ÖPG)  
*Quantum physics, simulation, and computation*  
Universität Graz, Graz, Austria, 18. – 21.09.2012

Workshop on Theoretical aspects of indeterminism and agency  
*On machine creativity and the notion of free will*  
University of Utrecht, The Netherlands, 12. – 13.01.2012

Workshop on Quantum to Classical Crossover in Mechanical Systems  
*Entanglement and intra-molecular cooling in biological systems*  
Lorentz Center, Leiden, The Netherlands, 04. – 07.10.2011

The Philosophy of Computer Science and Artificial Intelligence, ESF Ponta Delgada Workshop  
*Simulation, Computation, and (Quantum) Physics*  
Ponta Delgada, Azores, Portugal, 07. – 10.09.2011

14th Congress of Logic, Methodology and Philosophy of Science  
*Simulation, computation, and physics -- What can we learn about the world?"*  
Nancy, France, 19. – 26.07.2011

Theory of Quantum Computation (TQC 2011), Conference  
*Projected simulation for artificial intelligence*  
Madrid, Spain, 24. – 25.03.2011

Workshop on Entanglement, Quantum Information and the Quantum-to-Classical Transition  
*Quantum information and entanglement in biological systems*  
Rom, Italy, 05. – 07.05.2011

Quantum Repeater Workshop  
*Perspectives on the quantum repeater*  
Hannover, Germany, 24. – 25.03.2011

Workshop on Quantum Mechanics and Cancer Biology  
*Quantum information and entanglement in biological systems*  
Tempe, AZ, USA, 25. – 27.10.2010

Quantum Africa 2010 (conference)  
*Quantum effects in Biology*  
Durban, South Africa, 20. – 23.09.2010

Safed Workshop on Quantum Decoherence and Thermodynamics  
*Quantum control and entanglement in biological systems*  
Safed, Israel, 22.-29.08.2010

SCALA Summer School on Scalable Quantum Computing with Light and Atoms  
*Measurement-based quantum computation*  
Cargese, Corsica, 17.-29.08.2010

19th International Laser Physics Workshop

*Quantum information and entanglement in biological systems*

Foz do Iguaçu, Brasil, 05. – 09.07.2010

The Principles and Applications of Control in Quantum Systems (PRACQSYS 2010)

*Quantum information and entanglement in biological systems*

The Sandbjerg Estate Aarhus University Conference Center, Sønderborg, Denmark, 15. – 18.06.2010

ESF Research Conference: Quantum Engineering of States and Devices: Theory and Experiments

*Quantum effects in biological systems*

Universitätszentrum Obergurgl, Obergurgl, Austria, 05. – 10.06.2010

14<sup>th</sup> annual Seven Pines Workshop: Decoherence and Entanglement

*Entanglement and (de)coherence in biology*

Stillwater, Minnesota, USA, 5.-9.5.2010

Workshop on Quantum measurement and chemical spin dynamics

*Entanglement in biological systems*

Lorentz Center, Leiden, The Netherlands, 15. – 19.03.2010

Symposium on Quantum coherence effects, in Honour of Marlan O. Scully

*Quantum control and entanglement in the avian chemical compass*

Ulm, Germany, 11.-12.02.2010

Workshop on Entanglement beyond the Optical Regime

*Cluster and Graph States*

Anaheim/Orange County, CA, USA, 07. – 10.02.2010

2nd Black Forest Focus on Soft Matter

Entanglement and intra-molecular cooling in biological systems

Titisee, Germany, 22. - 24.10.2009

International Conference on Quantum Foundation and Technology: Frontier and Future

*Quantum control and entanglement in the avian compass*

Shanghai, PR of China, 17. – 22.07.2009

Workshop on Quantum Effects in Biological Systems (QuEBS 2009)

*Quantum control and entanglement in the chemical compass*

Lisbon, Portugal, 07. – 10.07.2009

The 39<sup>th</sup> Winter Colloquium on the Physics of Quantum Electronics (PQE 09)

*Entanglement in biological systems? - A quantum thermodynamic perspective*

Snowbird, Utah, USA, 04. – 08.01.2009

Nanosystems Initiative Munich (NIM) Workshop: Nonequilibrium thermodynamics at the nanoscale

*Entanglement dynamics in open dissipative systems*

Augsburg, Germany, 24. – 25.09.2008

Gordon Research Conference (GRC) 2008 on Quantum Information Science  
*Entanglement in Quantum Many Body Systems*  
Big Sky, Montana, USA, 31.08. – 05.09.2008

Conference on Frontiers of Quantum and Mesoscopic Thermodynamics  
*Entanglement in quantum many-body systems far away from equilibrium: Are there non-trivial quantum effects in biology?*  
Prague, Czech Republic, 28.07. – 02.08.2008

Fachgespräch Quanteninformationstechnologien  
*Der Quantenrepeater als Modellsystem für die Quanteninformationstechnologie*  
Bonn, Bad Godesberg, Germany, 11.06.2008

International workshop on the mathematical foundations of quantum control and quantum information theory  
*Recent developments in measurement-based quantum computations*  
Madrid, Spain, 26. – 30.05.2008

The Optical Society (OSA) Workshop on Entanglement and Quantum Decoherence (EQD)  
*Entanglement in quantum many-body systems far away from thermodynamic equilibrium*  
Nara, Japan, 28. – 30.01.2008

Workshop on Noise Information & Complexity @ Quantum Scale  
*Entanglement in quantum systems far away from TD equilibrium-- Are there non-trivial quantum effects in biology?*  
Ettore Majorana Centre, Erice (Sicily), Italy, 04. 10.11.2007

Interfaces between Physics and Computer Science, Summer School  
*Entanglement in spin gases & lattices; weighted graph states*  
Bremen, Germany, 11. – 22.06.2007

Interfaces between Physics and Computer Science, Summer School  
*Theory of measurement-based quantum computation - Cluster and graph states as entanglement resources criteria for universality*  
Bremen, Germany, 11. – 22.06.2007

2007 Workshop in Quantum Algorithms and Applications (QAA07), Sydney  
*Universality and simulation of measurement-based quantum computation*  
Sydney, Australia, 28.05. – 02.06.2007

Gordon Research Conference (GRC) on Quantum Information Science  
*Universality and classical simulation of quantum computation*  
Il Ciocco, Barga, Italy, 15. – 20.04.2007

71. Jahrestagung der Deutschen Physikalischen Gesellschaft und DPG Frühjahrstagung des Arbeitskreises Festkörperphysik  
*Universality and classical simulation of quantum computation*  
Regensburg, Germany, 26. – 30.03.2007

International Workshop on Measurement-based quantum computing (MBQC)  
*Universal resources for measurement-based quantum computation*  
Oxford, United Kingdom, 18. – 21.03.2007

QUROPE Winter School on Quantum Information  
*Introduction to basic concepts of quantum information and computation*  
Oberurgl, Austria, 18.-24.2.2007

8th International Conference on Quantum Communication, Measurement and Computing  
*Universality and classical simulation of quantum computation*  
Tsukuba, Japan, 28.11. – 03.12.2006

2006 US-Japan Workshop on Quantum Information Science  
*Multi-partite entanglement purification and applications*  
Wailea Conference Center, Maui, Hawaii, USA, 16. – 20.10.2006

The International Conference on Quantum Foundation and Technology: Frontier and Future (ICQFT'06)  
*Universality and classical simulation of quantum computation*  
Hangzhou, PR of China, 25. – 31.08.2006

Workshop on Theory and Technology in Quantum Information, Communication, Computation and Cryptography  
*Universal resources for measurement-based quantum computation*  
Miramare, Trieste, Italy, 12. – 23.06.2006

2nd Bellairs 2006 Workshop on “Logical and Semantical Methods in Quantum Computation”  
*A measurement-based framework for treating SAT-problems*  
Bellairs Research Centre, Holetown, Barbados, 20. – 24.03.2006

2nd Bellairs 2006 Workshop on “Logical and Semantical Methods in Quantum Computation”  
*Universal resources for quantum computation*  
Bellairs Research Centre, Holetown, Barbados, 20. – 24.03.2006

8th Annual Workshop "Southwest Quantum Information and Technology (SQInT) 2006  
*Introduction to graph states and the one-way quantum computer (tutorial)*  
Albuquerque, New Mexico, USA, 17. – 19.02.2006

Kavli Institute for Theoretical Physics (KITP) workshop “Topological Phases and Quantum Computation”  
*Entanglement in strongly interacting many-body systems*  
University of California, Santa Barbara, Cal. USA, 21.02. – 19.05.2006

The 36<sup>th</sup> Winter Colloquium on the Physics of Quantum Electronics (PQE 06)  
*Steady-state entanglement in open driven quantum systems*  
Snowbird, Utah, USA, 02. – 06.01.2006

Workshop on Bose-Einstein Condensation and Quantum Information  
*Entanglement and decoherence in spin gases*  
Erwin Schrödinger Institute, Vienna, Austria, 18. – 20.12.2005

Workshop on Being Bayesian in a Quantum World (BBQW)

*What is a quantum computation?*

Konstanz, Germany, 01. – 05.08.2005

Perimeter Institute for Theoretical Physics (PI) Workshop “Quantum Information, Computation and Logic: Exploring New Connections”

*What is a quantum computation?*

Perimeter Institute, Waterloo, Canada, 17. – 22.07.2005

International School of Physics “Enrico Fermi”

*Quantum information and entanglement, one-way quantum computer*

Varenna, Italy, 05. – 15.07.2005

9th International Conference on Squeezed States and Uncertainty Relations (ICSSUR’05)

*Entanglement and decoherence in a spin gas*

Besancon, France, 02. – 06.05.2005

3rd Asia Workshop on Quantum Information Science

*Lecture Series on graph states & applications in Quantum Information and Entanglement and decoherence in spin gases*

Singapore, 4.1.-15.1.2005

Workshop on Quantum Entanglement in Physical and Information Sciences

*Entanglement and Decoherence in semi-quantal gases*

Pisa, Italy, 14.12. - 18.12.2004

Workshop on Quantum Information Science 2004 (QIS)

*Entanglement in semi-quantal gases*

Cambridge, United Kingdom, 20.9-1.10.2004, 29.11-2.12.2004

International Symposium on Entanglement, Information & Noise

*Theory of graph states*

Krzyzowa (Kreisau), Poland, 15.6.-18.6.2004

Dagstuhl Perspectives Workshop on Quantum Computing

*Quantum computing and multiparticle entanglement*

Schloss Dagstuhl, Wadern, Germany, 11.5.-14.5.2004

Hirschegg International DFG workshop, Quantum Entanglement – From Error Correction to Secure Key Distribution

*Theory of graph states*

Hirschegg, Germany, 1.4.-2.4.2004

Gordon Conference on Quantum Information Science

*Macroscopic entanglement, (Chairman)*

Ventura, California, USA, 22.2.-27.2.2004

NORDITA/QUANTOP Workshop on Quantum Information and Ordered Systems

*Entanglement in graph states*

Niels Bohr Institute (NBI), Copenhagen, Denmark, 11.9.-14.9.2003



Benasque meeting on quantum information and quantum optics

*Graph states and their applications*

Benasque, Spain, 22.6.-11.7.2003

European Science Foundation (ESF) meeting on Quantum Information and Computation

*Multi-party entanglement purification of a class of graph states*

Erice, Sicily, Italy, 15.3.-22.3.2003

Obergurgl Quantum Optics Meeting

*Multi-party entanglement purification of a class of graph states*

Obergurgl, Austria, 23.2.-1.3.2003

Mathematics in Nanoscale Science and Engineering -- NANO2002 Workshop II: Joint IPAM/MSRI

Workshop on Quantum Computing

*Measurement-based quantum computation*

University of California, Los Angeles, USA, 21.10-23.10.2002

Quantum Foundations in the Light of Quantum Information

*The quantum-foundational significance of measurement-based models of quantum computation*

Centre de Recherches Mathematiques (CRM) Universite de Montreal, Canada, 13.10.-20.10.2002

Wigner Centennial Conference

*Measurement-based quantum computation*

Pecs, Hungary, 8.7.-12.7.2002

NIST Meeting on Quantum Computation in Optical Lattices

*Measurement-based quantum computation*

National Institute of Standards and Technology (NIST), Gaithersburg, Maryland, USA, 3.6.-5.6.2002

Quantum Information Theory Workshop

*Private entanglement over noisy channels*

Trinity College, Dublin, Ireland, 21.3.-23.3.2002

NOSTACK Workshop on the implications of recent results in quantum computing for the future of information security

*Security of quantum repeaters and long distance quantum communication*

Schlosshotel Weyberhoeffe, Sailauf, Germany, 21.1.-23.1.2002

The Fifth Workshop on Quantum Information Processing (QIP 2002)

*Quantum computing using cluster states*

IBM T.J. Watson Research Center, Yorktown Heights, New York, USA, 14.1.-17.1.2002

ITP Conference on Quantum Information

*Quantum computing using one-qubit measurements only*

Santa Barbara, California, USA, 26.12.-30.12.2001

Workshop on coherent evolution in noisy environments (COHEVOL)

*Multiparticle entanglement and quantum computation in spin lattices with an Ising-type interaction*

Max-Planck-Institut für komplexe Systeme, Dresden, Germany, 25.5.2001

Workshop on solid-state quantum computing  
*Quantum computers and multi-particle entanglement in spin-lattices*  
Warsaw, Poland, 26.4.-29.4.2001

ECAMP / DPG Frühjahrstagung Berlin  
*Quantum computers and multiparticle entanglement ("Hot topic talk")*  
Berlin, Germany, 2.4.-6.4.2001

GAFOS 2001- German-American Frontiers of Science Symposium  
*Theory of quantum information and computation (Invited Poster)*  
Bad Homburg, Germany, 7.6.-10.6.2001

Workshop on quantum information processing and communication (QIPC)  
*Persistent entanglement in arrays of interacting particles*  
Potsdam, Germany, 27.9-29.9.2000

Workshop on quantum information and quantum optics  
*Multiparticle entanglement in arrays of interacting particles*  
Benasque, Spain, 10.7.2000

LMU München, Öffentlicher Informationsabend zum Thema: "Mit Quanten ist zu rechnen. Kalte Materie, Chaos und Computer aus quantenmechanischer Sicht"  
*Quantencomputer und Kryptographie*  
München, Germany, 23.5.2000

Cryptography meeting  
*Security in long-distance quantum cryptography*  
Royal Holloway College, London, United Kingdom, 26.5.2000

Conference on Quantum Communication Measurement, and Computing (QCM98)  
*Quantum repeaters for communication*  
Evanston, Illinois, USA, 22.8.-27.8.1999

Laser 99 (Budapest)  
*Quantum computing in optical lattices*  
Budapest, Hungary, 2.7.-6.7.1999

Quantum Electronics and Laser Science Conference (QELS)  
*Quantum information, networks, and computing*  
Baltimore, Maryland, USA, 23.5.-28.5.1999

Spring meeting of the German Physical Society  
*Imperfekte lokale Operationen und ihre Bedeutung für die Quantenkommunikation*  
Heidelberg, Germany, March 1999

Spring meeting of the German Physical Society  
*Quantum computing in optischen Gittern*  
Heidelberg, Germany, March 1999

QIKI Workshop über Quanten-Informatik  
*Quanten-Computing in optischen Gittern*  
Universität Karlsruhe, Germany, 21.12.-22.12.1998

Hannover, Verschränkung  
*EPR-Paare und ihre Relevanz für die Quantenkommunikation*  
Norddeutscher Lasertag, Germany, 9.12.1998 (Plenary Talk)

International Conference on Trapped Charged Particles and Fundamental Physics  
*Quantum computing in optical lattices*  
Monterey, California, USA, 31.8.-4.10.1998

TMR meeting on the Physics of Quantum Information  
*Quantum repeaters*  
Helsinki, Finland, 24.9.-26.9.1998

Workshop on Quantum Information and Quantum Optics  
*Quantum repeaters for communication*  
Benasque, Spain, July 1998

Workshop on Quantum Computation and Mesoscopic Physics  
*Quantum repeaters for communication*  
Scuola Normale Superiore, Pisa, Italy, 25.6.-27.6.1998

Dagstuhl-Seminar on Quantum Algorithms  
*Quantum repeaters for communication*  
Schloss Dagstuhl, Wadern, Germany, 10.5.-15.5.1998

EMCSR98 - Meeting on Cybernetics and Systems Research  
*Einstein-Podolsky-Rosen correlations made useful: A quantum-communication perspective*  
Vienna, Austria, 14.4.-17.4.1998

Spring meeting of the German Physical Society  
*Quantum repeaters: Quantum communication over dissipative information channels*  
Konstanz, Germany, March 1998

Almagro workshop on quantum information, Universidad Castilla la Mancha  
*Quantum communication over noisy channels*  
Almagro (Ciudad Real) Spain, 16.10.-19.10.1997

APS annual meeting  
*Multiple light scattering from a pair of non-identical atoms, (Poster)*  
Washington, USA, April 1997

24th Winter Colloquium on the Physics of Quantum Electronics  
*Interactive photodetection in cavity-QED experiments*  
Snowbird, Utah, USA, 12.1.-15.1.1997

Conference on Quantum Coherence and Interference in Fundamental and Applied Physics  
*Influence of atomic-beam statistics on the emission spectrum of a microlaser*  
Alta, Wyoming, USA, 9.8.-12.8.1995

NSF Summer School on the Foundations and Applications of Quantum Mechanics  
*Quantum Theory of the Laser*  
Casper College, Wyoming, USA, 1.8-6.8.1995

Laser Optics Conference 95  
*Dynamic noise reduction in multi-level lasers: Nonlinear theory and the damping basis approach*  
St. Petersburg, Russia, 26.6-1.7.1995

25th Winter Colloquium on the Physics of Quantum Electronics  
*Spectral properties of a laser with nonpoissonian atomic injection*  
Snowbird, Utah, USA, 3.1-6.1.1995

Atomic Physics Symposium in Honor of Willis E. Lamb  
*Coherent atom-field interaction and the quantum theory of the laser*  
Texas A&M University, Texas, USA, 18.11-19.11.1994

Annual Meeting of the Optical Society of America  
*Corrections to reservoir theory in the one-atom laser*  
Dallas, Texas, USA, 2.10-7.10.1994

Conference on Atomic Coherence and Interference in Applied and Fundamental Physics  
*Dynamical noise reduction in the ion-trap laser*  
Crested Butte, Colorado, USA, 7.8-11.8.1994

Spring meeting of the German Physical Society  
*Ein-Atom-Maser mit periodischem und verrauschtigtem Pumpen*  
Hamburg, Germany, March 1994

MPQ Summer Festival 92  
*Master equations for lossy systems*  
Garching, Germany, July 1992

Spring meeting of the German Physical Society  
*Jaynes-Cummings-Modell mit Dämpfung*  
Hamburg, Germany, 23.2.1992

### **Invited Colloquia and Seminars**

Munich Center for Mathematical Philosophy (MCMP), *Projective simulation as a model for learning and agency*, 13.12.2017, (Colloquium)

Universität Konstanz, Kolloquium AG Müller, *The view from nowhere. Why physics should care about agency*, 20.07.2017, (Seminar)

Universität Konstanz, Philosophisches Kolloquium, *Projective Simulation in Action: Handlungen in der (Quanten-)Physik*, 17.11.2016, (Colloquium)

Universität Konstanz, Physikalisches Kolloquium, *Quantum physics meets artificial intelligence*, 08.11.2016, (Colloquium)

Freiburg, Institute for Advanced Studies (FRIAS), *Projective simulation for learning agents*, 14.07.2015 (Colloquium)

University of Vienna, CoQuS Colloquium, *Quantum agents, simulation, and biology*, 16.12.2013 (Colloquium)

University of New Mexico, Centre for Quantum Information and Control (CQuIC), *Quantum computers, simulators and agents*, 21.11.2013 (Seminar)

Universidad Complutense Madrid, *Quantum agents, simulation, and biology*, 23.10.2013 (Seminar)

Descartes Centre for the History and Philosophy of the Sciences and the Humanities (Universiteit Utrecht), *Quantum computers, simulators, and agents*, 20.06.2013 (Seminar)

Munich Physics Colloquium (LMU), *Quantum computers, simulators, and agents*, 13.05.2013 (Colloquium)

MCMP - Munich Center for Mathematical Philosophy (LMU), *On agency and freedom under the laws of nature*, 24.04.2013, (Colloquium)

Colloqui delle Classe di Scienze (Scuola Normale Superiore di Pisa), *Quantum physics, computation, and simulation*, 17.04.2013 (Colloquium)

Institute for Christian Philosophy, University of Innsbruck, *On agents, creativity, and freedom under the laws of Nature*, 10.04.2013 (Seminar)

Physikalisches Kolloquium (Friedrich-Alexander-Universität, Erlangen-Nürnberg), *Quantum Physics, Simulation, and Computation*, 10.12.2012, (Colloquium)

The Zurich Physics Colloquium (ETH Zurich), *Quantum physics, computation, and biology*, 02.05.2012, (Colloquium)

Bristol, Department of Physics, *Quantum control and entanglement in the chemical compass*, 07.10.2009, (Seminar)

Freiburg , FRIAS, *Non-trivial quantum effects in biology?*, 29.06.2009, (Colloquium)

Ulm, Universität Ulm, *Quanteninformation in der Biologie*, Physikalisches Kolloquium , 27.04.2009, (Colloquium)

UBC Vancouver, Physics Department, *Entanglement in quantum many-body systems away from thermodynamic equilibrium*, Dec. 2008 (Seminar)

Calgary, Institute for Quantum Information Science University of Calgary, *Entanglement in quantum many-body systems away from thermodynamic equilibrium*, 11.12. 2008, (Colloquium)

Augsburg, Augsburger Physikalisches Kolloquium, *Entanglement in non-equilibrium quantum many-body systems. - Are there non-trivial quantum effects in biology?*, 24.11.2008, (Colloquium)

Singapore, Centre for Quantum Technologies, *New developments in measurement-based quantum computation*, 25.03.2008, (Colloquium)

RIKEN, Tokyo (Nori group), *Multi-partite entanglement in ordered and disordered systems*, 1.2.2008 (Seminar)

RIKEN, Tokyo (Nori group), *Lectures on graph states*, 31.01.2008 (Seminar)

Rom, University La Sapienza, Physics Department, *Theory of graph states and its applications*, 30.01.2007, (Colloquium)

Bayreuth, University, *Quanteninformation und Verschränkung in Vielteilchensystemen*, 13.12.2005 (Colloquium)

Kaiserslautern, University, *Multi-particle entanglement in ordered and disordered systems*, 09.02.2005, (Colloquium)

Hefei, Hefei USTC, *Theory of graph states*, 2.11.-15.11.2004 (Seminar)

Peking, Tsinghua University, (1) *Measurement-based quantum computation*, (2) *Theory of graph states*, 2.11.-15.11.2004 (Seminar)

Zürich, ETH Zürich, *Theory of graph states*, 24.5.2004 (Seminar)

Garching, MPI für Quantenoptik, *Multiparticle entanglement & Quantum Computing*, 4.5.2004 (Seminar)

Wien, Technical University, *Theory of graph states*, 15.3.2004 (Seminar)

Caltech, Institute for Quantum Information, *Graph states: Properties & Application*, 10.2.2004 (Seminar)

Essen, University, *Quantencomputer: Konzepte und Perspektiven*, 10.12.2003 (Colloquium)

Dresden, MPI für komplexe Systeme, *Multiparty entanglement purification of a class of graph states*, 28.4.2003 (Colloquium)

Tübingen, University, *Quantencomputer: Konzepte und Perspektiven*, 5.2.2003 (Colloquium)

Innsbruck, University, *Quantencomputing and Quantencommunication*, 24.1.2003 (Colloquium)

München, LMU University, *Quanten-Information und Computer*, 29.11.2002 (Tag der Informatik)

Düsseldorf, University, 12.6.2002 (Seminar)

Bell Labs (Lucent), *Quantum computing using cluster states*, 18.1.2002 (Seminar)

Stuttgart, University, *Entanglement, Correlation, and Logic*, 10.1.2002 (Seminar)

Innsbruck, University, *Quanteninformationsverarbeitung*, 14.12.2001 (Computer Science Colloquium)

Neuchatel, University, *Quantum information and computer*, 29.1.2001 (Colloquium)

Braunschweig, University, *Multipartite entanglement and quantum computation*, 24.1.2001 (Seminar)

Darmstadt, Technical University, *Quantenkommunikation und Quantencomputer*, 5.1.2001 (Colloquium)

Karlsruhe, University, *Skalierbare Quantenrechner*, 7.11.2000 (Computer Science Colloquium)

Infineon (Company), *Quantencomputer und Kryptographie*, 29.6.2000 (Seminar)

Oxford University, *Persistent entanglement in arrays of interacting particles*, 30.5.2000 (Seminar - Ekert group)

Halle, University, *Quantum information and computer*, 19.1.2000 (Seminar)

Erlangen, University, *Quantencomputer und Quantenkommunikation*, 13.12.1999 (Colloquium)

Stuttgart, Technical University, *Quantum information and computing*, 7.12.1999 (Seminar)

Munich, University (LMU), *Quantencomputer und Quantenkommunikation*, 17.11.1999 (Fakultätskolloquium)

Munich, Technical University (TU), *Quantencomputer und Quantenkommunikation*, 30.6.1999 (Theoretical Physics Colloquium)

Hamburg, Institut für Laserphysik, *Quantum computing in optical lattices*, 8.6.1999 (Seminar)

NIST Gaithersburg, *Quantum computing in optical lattices*, Bill Phillips Group, 28.5.1999 (Seminar)

Harvard University, *Quantum computing in optical lattices*, Joint Atomic Physics Colloquium, 15.5.1999

Pavia University, *Quantum computing in optical lattices*, Theoretical Quantum Optics Seminar, 25.3.1999

Oxford University, *Quantum repeaters*, Centre for Quantum Computation, Artur Ekert group, 27.1.1999 (Seminar)

Innsbruck, University, *Quantum repeaters and communication*, 29.4.1998, (Seminar)

Munich, University (LMU), *Quantum repeaters and communication*, Oberseminar über aktuelle Probleme der Theoretischen Physik, 20.2.1998

Optical Science Center, *Interactive Photon Counting*, Quantum Optics Seminar, Tucson, Arizona, USA, 14.1.1997

Harvard-Smithsonian Center for Astrophysics, *Interactive Photon Counting*, ITAMP Colloquium, Massachusetts, USA, 9.12.1996

Harvard University, *Laser dynamics of single (trapped) atoms*, Rick Heller group seminar, Cambridge, Massachusetts, USA, 2.2.1996 and 23.2.1996

UT Austin, *Laser dynamics of single (trapped) atoms*, Atomic Physics Seminar, Austin, Texas, USA  
17.11.1995

Oregon, University, *Atomic beam statistics and the emission spectrum of a microlaser*, Quantum Optics Seminar, Eugene, Oregon, USA, 24.8.1995

Munich University (LMU), *Dynamic noise reduction in multilevel lasers*, Quantum Optics Seminar, Munich, Germany, 13.7.1995

Gesamthochschule Essen, *Dynamic noise reduction in multilevel lasers*, Quantum Optics Seminar, Essen, Germany, 19.6.1995

Innsbruck, University, *Dynamic noise reduction in multilevel lasers*, Quantum Optics Seminar, Innsbruck, Austria, 4.7.1995

Harvard University, *Dynamics of microscopic lasers and masers*, Atomic Physics Seminar, Cambridge, Massachusetts, USA, 22.3.1995

University of North Texas, *Quantum effects in microscopic lasers and masers*, Colloquium, Denton, Texas, USA, 28.2.1995

University of Houston, *Quantum effects in microscopic lasers and masers*, Colloquium, Houston, Texas, USA, 7.2.1995

Texas A&M University, *Theory of damping-bases*, Atomic Physics Seminar, College Station, Texas, USA, 6.12.1994

Max-Planck-Institut für Quantenoptik, *The damping-basis method: A novel approach to treating dissipative systems in quantum optics*, Theory Seminar, Garching, Germany, 30.6.1994

AG Nichtklassische Strahlung, Humboldt University Berlin, *Dynamics of a microlaser with aperiodic and noisy pump*, Laser Seminar, Berlin, Germany, Feb. 1994

University of Munich (LMU), *Ein-Atom-Maser mit variabler Pumpstatistik*, Quantum Optics Seminar, Munich, Germany, 26.2.1993

Max-Planck-Institut für Quantenoptik, *Jaynes-Cummings model with damping*, Theory Seminar, Garching, Germany, 12.2.1992

University of Munich (LMU), *Jaynes-Cummings Modell mit Dämpfung*, Seminar, Munich, Germany, 17.1.1992