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<https://portamana.org/>

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Synopsis

My experience and interests include Bayesian probability calculus, neuroscience, continuum thermomechanics, quantum theory, general relativity, differential geometry. I also have a passion for modern logic and history of science. In each of the mentioned subjects I have published original research or given popularizing seminars and lectures.

My teaching and supervising experience ranges from ground-school children to PhD students, in academic institutions and as private tutor.

In research and in teaching, I believe in broadness and interdisciplinarity rather than specialization: the diverse fields in physics, mathematics, probability, and all sciences are just one, as one is the sky above us.

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Research and education

- 2018-05 – present: **Post-doctoral researcher**,
Kavli Institute for Systems Neuroscience, NTNU Norwegian University of Science and Technology, Norway.
Bayesian probability theory, applied to inference of brain diseases from fMRI data, maximum-entropy methods, and models for psychology.
- 2017-03 – 2018-04: **Independent researcher**,
Joint research with Forschungszentrum Jülich (Germany) and Cagliari University (Italy); see [publications](#).
Bayesian inference of brain diseases from fMRI data. Foundations of maximum-entropy methods. Development of ocean models with spin. Improvement of neuronal simulator algorithms. Foundations of continuum mechanics within general relativity.
- 2014-11 – 2017-03: **Post-doctoral researcher**,
Institute of Neuroscience and Medicine 6, Forschungszentrum Jülich, Germany.
Bayesian and maximum-entropy methods for detection of behaviour-related patterns in neural activity. Relations between finer & coarser theories of brain activity. Sampling theory for neuronal recordings.
- 2011-11 – 2014-01: **Post-doctoral researcher**,
Climate and Ocean Physics group, University of Oxford, UK.
Stochastic & deterministic theories for geophysical fluid dynamics and their numeric implementation. Relations between finer & coarser dynamical theories. Maximum-entropy and autoregressive models.
- 2012-08: **Bayesian statistics consultant**,
The Guide Dogs for the Blind Association, UK.
Bayesian exchangeable models for estimation of the number of visually impaired children in some UK counties, given data from nearby counties.
- 2008-10 – 2011-10: **Post-doctoral fellow**,
Quantum Foundations group, Perimeter Institute for Theoretical Physics, Canada.
Foundations of quantum theory and theory of hybrid statistical models. Description of quantum phenomena via stochastic continuum mechanics.

Non-equilibrium statistical mechanics. Continuum theories in general relativity.

2007-08 – 2008-09: **Post-doctoral researcher**,

Non-Linear Physics research group, Umeå University, Sweden.

Quantum kinetic theory for plasmas with spin. Stochastic continuum thermomechanics. Non-equilibrium statistical mechanics.

2008-08: **PhD**, thesis on *Studies in plausibility theory, with applications to physics* (<https://portamana.org/>).

2002-11 – 2007-06: **PhD studies**,

Quantum Electronics and Quantum Optics group, KTH Royal Inst. of Technology, Stockholm.

Quantum communication & quantum optics. Beam- and fibre-based interferometry for time-bin entanglement. State estimation and tomography techniques. Bayesian statistical models for quantum and hybrid theories.

2002-09 – 2002-10: **Experimental collaborator**,

Quantum Electronics and Optics group, KTH Royal Inst. of Technology, Stockholm.

Quantum communication. Quantum optics. Beam- and fibre-based interferometry for time-bin entanglement.

2001-01 – 2002-08: **Graduate studies**,

Department of Theoretical Physics, KTH Royal Inst. of Technology, Stockholm.

General relativity. Quantum communication theory. Non-linear differential equations.

2000-04: **Italian Laurea** in theoretical physics,

Cagliari University, awarded with maximum grades “cum laude”.

Thesis on *Asymptotic symmetries of anti-de Sitter space in two and three dimensions* (<https://portamana.org/>).

Dilatonic general relativity and its Hamiltonian formulation.

Pedagogical experience

PhD, MSc, BSc supervision:

2014 – present: **Co-supervisor** for several PhD students, Forschungszentrum Jülich, Germany.

Projects on maximum-entropy methods, Bayesian models and inference in neuroscience, state-space analysis of neuronal models.

2013: **Assistant supervisor for MPhys thesis**, University of Oxford.

2011 – 2012: **Full supervisor for BSc thesis**, Perimeter Institute for Theoretical Physics, Canada; KTH Royal Inst. of Technology, Stockholm; University of Oxford.

Thesis on *Obtaining Entropy via Coarsening: Microscopic Restrictions on Continuum-mechanical constitutive Equations*. The student Veronica Wallängen obtained maximum grades with distinction for her thesis.

2010: **Supervisor for BA project**, Perimeter Institute for Theoretical Physics, Canada, and Franklin W. Olin College of Engineering, MA, USA.

Project on *The relationships between plausibility theory and logic*.

Post-secondary education:

2004 – 2006: **Teacher**, Department of Microelectronics and Applied Physics, KTH Royal Inst. of Technology, Stockholm.

Exercise module of the course *Electromagnetism and waves* (20–30 students); preparation and graduation of written examinations.

2000: **Course tutor**, Department of Biology, Cagliari University.

Physics Laboratory course.

1996 – 1997: **Undergraduate tutor** for junior physics students, Department of Physics, Cagliari University.

1995 – 1996: **Undergraduate teacher**, Department of Physics, Cagliari University.

Introductory lectures in mathematics and physics for first-year undergraduate students (70–150 students).

Secondary education:

2009 – 2011: **Summer-school teacher**, International Summer School for Young Physicists, Perimeter Institute for Theoretical Physics, Canada.

Short courses on *Probability theory as extended logic: elements and fundamental*

questions; Feynman-diagram techniques in classical physics: quantum field theory without “particles”; and Pictorial introduction to even and odd vectors and covectors.

Other pedagogical activity:

1990 – 2000: **Private tutor** in physics, mathematics, Latin; Italy.

Pupils varying from ground-school children to graduating students.

2009 – 2011: **Pedagogical papers**, Perimeter Institute for Theoretical Physics, Canada.

On probability theory and differential geometry.

2003 – 2004: **Pedagogical papers and informal lectures**, KTH Royal Inst. of Technology, Stockholm.

On probability theory, differential geometry, thermomechanics.

2006: Course attendance, **Basic communication and teaching**, KTH Royal Inst. of Technology, Stockholm.

Memberships & associations

Society for Natural Philosophy (<http://www.ms.uky.edu/~snp/>),
2004 – present.

Electronic Frontier Foundation (<https://www.eff.org/>),
2016 – present.

Computational & modelling experience

Coding of time- & event-driven spike-based neuron models (NEST, C++).

Coding and analysis of geophysical-fluid-dynamical models with several timestepping schemes and stochastic components, in Fortran (finite differences) with parallel computing (MPI), and in FEniCS/Dolfin (finite elements).

Programming: very proficient with **Mathematica** (integration, solution of differential equations, data analysis, 3D & 4D plotting, symbolic manipulation, neural-network dynamics), **Matlab** (big data analysis, plotting), **R** (inference, data analysis, Monte Carlo methods), **Maple** (3D & 4D plotting); fairly proficient with **Python** (data analysis, plotting, stochastic dynamics), **Fortran** (solution of partial differential equations,

finite-difference simulations), **FEniCS/Dolfin** (solution of partial differential equations, finite-elements simulations), **LabView** (interferometric data recording and analysis), **NEST** (neural-network dynamics), and parallel programming (**MPI**). My **C** variants and **Lisp** are a bit rusty but functioning.

Laboratory experience

Experience in a quantum-optics laboratory and knowledge of its standard maintenance routines and safety measures. Use and care of equipment like lasers, optical elements, oscilloscopes, interferometers, modulators, etc. I have experience with the construction and set-up of fibre- and beam-based interferometers for detection of time-bin entanglement, including construction of parts of the metal frame, beam-fibre coupling maximization and stability, beam alignment and collimation, power monitoring and stabilization, placement of a thermal-stabilization and -monitoring system, coupling and programming (LabView) of various measuring and monitoring hardware and software.

Grants

Kempe foundations, Örnsköldsvik, Sweden: EUR 29 100/ USD 45 200 (SEK 275 000), for post-doctoral research in non-linear physics (2007).

Foundation *Blanceflor Boncompagni-Ludovisi, née Bildt*, Stockholm: EUR 8 500/ USD 13 200 (SEK 80 000), for graduate research in quantum communication theory (2002).

Foundation *Angelo Della Riccia*, Florence: EUR 6 900/ USD 10 700 (SEK 65 000), for graduate research in theoretical physics (2001).

Journal refereeing

Referee for: *Acta Physica Polonica A*, *American Journal of Physics*, *Annals of Physics*, *Foundations of Physics*, *International Journal of Theoretical Physics*, *Journal of Physical Chemistry*, *Journal of Physical Oceanography*, *New Journal of Physics*, *Quantum Information & Computation*, *Proceedings of the Royal Society A*, *Studies in History and Philosophy of Modern Physics*.

Languages & interests

Languages: **Italian**, mother tongue. **English**, fluent, spoken and written. **Swedish**, fluent, spoken and written. **French**, good reading and writing proficiency. **German**, fair reading and writing proficiency (mainly scientific writings). **Latin**, fair reading and writing proficiency. **Esperanto**, fair reading and writing proficiency. Beginner **Japanese**.

Other interests: Buster Keaton, Swing dancing, martial arts, parkour, literature, music, languages, flying, art, philosophy, typography, odradek & Urusei Yatsura.

Referees

Supervisors and mentors

(alphabetically)

Ingemar Bengtsson ingemar@fysik.su.se +46-(0)8-5537-8732
Professor, *Quantum Information & Quantum Optics* group
Stockholm University, Fysikum
Roslagstullsbacken 21, SE-104 06 Stockholm, Sweden

Mariano Cadoni mariano.cadoni@ca.infn.it +39-070675-4908
Professor, *Theoretical and High-energy Physics* group
Cagliari University & Istituto Nazionale di Fisica Nucleare
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Lucien Hardy lhardy@perimeterinstitute.ca +1-(519)-569-7600 x7521
Faculty, *Quantum Foundations* group
Perimeter Institute for Theoretical Physics,
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Moritz Helias m.helias@fz-juelich.de +49-(0)246161-9467
Professor, *Theory of Multi-scale Neuronal Networks* group
Forschungszentrum Jülich, Inst. for Neuroscience and Medicine-6
Wilhelm-Johnen-Straße, DE-52425 Jülich, Germany

Abigail Morrison a.morrison@fz-juelich.de +49-(0)246161-9805
Professor, *Functional Neural Circuits and Human Brain Model* groups

Bernstein Center Freiburg
Hansastraße 9a, DE-79104 Freiburg i.Br., Germany

Laure Zanna Laure.Zanna@physics.ox.ac.uk +44-(0)18652-72925
Professor, *Climate and Ocean Physics* group
University of Oxford, AOPP Clarendon Laboratory
Parks Road, OX1 3PU Oxford, UK

Former students

Vahid Rostami (PhD supervision)
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Forschungszentrum Jülich, INM-6,
Wilhelm-Johnen-Straße, DE-52425 Jülich, Germany

Tomos W. David (MPhys supervision)
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University of Oxford, AOPP Clarendon Laboratory,
Parks Road, OX1 3PU Oxford, UK

Veronica Wallängen (BSc supervision)
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University of California Berkeley & Stockholm University
Roslagstullsbacken 21, SE-104 06 Stockholm, Sweden

Daniel Franz (summer-school mentoring)
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Waterloo University,
61 C Eby St. S, Kitchener, ON N2G 3K9 Canada

Cyndia Yu (summer-school mentoring)
cyndiayu@college.harvard.edu +1-(480)-729-2937
Harvard College, Department of Physics,
524 Winthrop Mail Center, Cambridge MA 02138, USA

Publications & talks

In preparation

[4] **P.G.L. Porta Mana**, I. Bengtsson: *The beauty of Grassmann spaces*. Draft available upon request.

[3] **P.G.L. Porta Mana**: “*Eppur ruota*”: *modelling the ocean as a fluid with spin*. Draft available at Open Science Framework doi:[10.17605/osf.io/8pwc7](https://doi.org/10.17605/osf.io/8pwc7).

[2] **P.G.L. Porta Mana**: *Force, inertia, metric in Newtonian relativity and general relativity*. Draft available at Open Science Framework doi:[10.17605/osf.io/rvcxs](https://doi.org/10.17605/osf.io/rvcxs).

[1] **P.G.L. Porta Mana**, V. Wallängen: *A microscopic justification of the second law of thermodynamics (Clausius-Duhem inequality) as a restriction on constitutive equations*.

Papers and conference proceedings

See also Orcid profile <https://orcid.org/0000-0002-6070-0784>

[32] **P.G.L. Porta Mana**, V. Rostami, E. Torre, Y. Roudi: *Maximum-entropy and representative samples of neuronal activity: a dilemma*. Open Science Framework doi:[10.17605/osf.io/uz29n](https://doi.org/10.17605/osf.io/uz29n) (2018).

[31] **P.G.L. Porta Mana**, C. Bachmann, A. Morrison: *Inferring health conditions from fMRI-graph data*. Open Science Framework doi:[10.17605/osf.io/r2huz](https://doi.org/10.17605/osf.io/r2huz), arXiv:[1803.02626](https://arxiv.org/abs/1803.02626), bioRxiv doi:[10.1101/295113](https://doi.org/10.1101/295113), submitted to Brain Topography (2018).

[30] C. Bachmann, H. I. L. Jacobs, **P.G.L. Porta Mana**, K. Dillen, G. R. Fink, J. Kukulja, A. Morrison: *On the extraction and analysis of graphs from resting-state fMRI to support a correct and robust diagnostic tool for Alzheimer's disease*. Submitted to Front. Neurosci. (2018).

[29] **P.G.L. Porta Mana**: *Quantum theory within the probability calculus: a there-you-go theorem and partially exchangeable models*, Open Science Framework doi:[10.17605/osf.io/m38x6](https://doi.org/10.17605/osf.io/m38x6), arXiv:[1803.02263](https://arxiv.org/abs/1803.02263) (2018).

- [28] **P.G.L. Porta Mana**: *Unlearning and Seyab's theorem: a dialogue about updating probability*, Open Science Framework doi:10.17605/osf.io/wptc4, arXiv:1802.00807 (2018).
- [27] J. Krishnan, **P.G.L. Porta Mana**, M. Helias, M. Diesmann, E. A. Di Napoli: *Perfect detection of spikes in the linear sub-threshold dynamics of point neurons*, arXiv:1706.05702, doi:10.3389/fninf.2017.00075, in Front. Neuroinf. (2017).
- [26] V. Rostami, **P.G.L. Porta Mana**, M. Helias: *Pairwise maximum-entropy models and their Glauber dynamics: bimodality, bistability, non-ergodicity problems, and their elimination via inhibition*, arXiv:1605.04740, doi:10.1371/journal.pcbi.1005762, in PLoS Comp. Biol. (2017).
- [25] **P.G.L. Porta Mana**: *Geometry of maximum-entropy proofs: stationary points, convexity, Legendre transforms, exponential families*, Open Science Framework doi:10.17605/osf.io/vsq5n, arXiv:1707.00624 (2017).
- [24] **P.G.L. Porta Mana**: *Maximum-entropy from the probability calculus: exchangeability, sufficiency*, Open Science Framework doi:10.17605/osf.io/xdy72, arXiv:1706.02561 (2017).
- [23] L. Zanna, **P.G.L. Porta Mana**, J. Anstey, T. David, T. Bolton: *Scale-aware deterministic and stochastic parametrizations of eddy-mean flow interaction*, doi:10.1016/j.ocemod.2017.01.004, in Ocean Modell. (2017).
- [22] **P.G.L. Porta Mana**, E. Torre, V. Rostami: *Inferences from a network to a subnetwork and vice versa under an assumption of symmetry*, bioRxiv doi:10.1101/034199 (2015).
- [21] **P.G.L. Porta Mana**, L. Zanna: *Toward a stochastic parametrization of ocean mesoscale eddies*, <https://portamana.org/linko.php?w=portamanaea14.pdf>, in Ocean Modell. (2014).
- [20] **P.G.L. Porta Mana**, Peter G. Lewis: *On two recent conjectures in convex geometry*, arXiv:1105.4641 (2011).
- [19] **P.G.L. Porta Mana**: *Conjectures and questions in convex geometry: of interest for quantum theory and other physical statistical theories*, arXiv:1105.3238, doi:10.17605/OSF.IO/8ANWR (2011).

- [18] **P.G.L. Porta Mana**: *Notes on affine and convex spaces*, [arXiv:1104.0032](#) (2011).
- [17] **P.G.L. Porta Mana**: *In favour of the time variable in classical thermodynamics*, [arXiv:1012.3091](#) (2010).
- [16] **P.G.L. Porta Mana**: *On the relation between plausibility logic and the maximum-entropy principle: a numerical study*, [arXiv:0911.2197](#) (2009).
- [15] G. Brodin, M. Marklund, J. Zamanian, Å. Ericsson, **P.G.L. Porta Mana**: *Effects of the g -factor in semi-classical kinetic plasma theory*, [arXiv:0809.2382](#), [doi:10.1103/PhysRevLett.101.245002](#), in Phys. Rev. Lett. (2008).
- [14] **P.G.L. Porta Mana**: *Studies in plausibility theory, with applications to physics*, Ph.D. thesis, <https://portamana.org/linko.php?w=mana070106-thesis.pdf> (2007).
- [13] **P.G.L. Porta Mana**, A. Månsson, G. Björk: *The Laplace-Jaynes approach to induction*, [arXiv:physics/0703126](#) (2007).
- [12] A. Månsson, **P.G.L. Porta Mana**, G. Björk: *Numerical Bayesian state assignment for a quantum three-level system. II. Average-value data with a constant, a Gaussian-like, and a Slater prior*, [arXiv:quant-ph/0701087](#) (2007).
- [11] A. Månsson, **P.G.L. Porta Mana**, G. Björk: *Numerical Bayesian state assignment for a three-level quantum system. I. Absolute-frequency data, constant and Gaussian-like priors*, [arXiv:quant-ph/0612105](#) (2006).
- [10] **P.G.L. Porta Mana**, A. Månsson, G. Björk: *'Plausibilities of plausibilities': an approach through circumstances*, [arXiv:quant-ph/0607111](#) (2006).
- [9] **P.G.L. Porta Mana**, A. Månsson, G. Björk: *On distinguishability, orthogonality, and violations of the second law: contradictory assumptions, contrasting pieces of knowledge*, [arXiv:quant-ph/0505229](#) (2005).
- [8] **P.G.L. Porta Mana**: *Distinguishability of non-orthogonal density matrices does not imply violations of the second law*, [arXiv:quant-ph/0408193](#) (2004).

- [7] G. Björk, **P.G.L. Porta Mana**: *Schrödinger-cat states: size classification based on evolution or dissipation*, doi:10.1117/12.547048, in Proc. SPIE (2004).
- [6] **P.G.L. Porta Mana**: *Probability tables*, arXiv:quant-ph/0403084, in A. Yu. Khrennikov, ed.: "Quantum Theory: Reconsideration of Foundations – 2" (Växjö University Press, 2004) (2004).
- [5] G. Björk, **P.G.L. Porta Mana**: *A size criterion for macroscopic superposition states*, arXiv:quant-ph/0310193, doi:10.1088/1464-4266/6/11/001, in J. Opt. B (2003).
- [4] **P.G.L. Porta Mana**: *Why can states and measurement outcomes be represented as vectors?*, arXiv:quant-ph/0305117 (2003).
- [3] **P.G.L. Porta Mana**: *Consistency of the Shannon entropy in quantum experiments*, arXiv:quant-ph/0302049, doi:10.1103/PhysRevA.69.062108, in Phys. Rev. A and in Virtual J. Quantum Information (2003).
- [2] M. Cadoni, **P.G.L. Porta Mana**: *Hamiltonians for a general dilaton gravity theory on a spacetime with a non-orthogonal, timelike or spacelike outer boundary*, arXiv:gr-qc/0011010, doi:10.1088/0264-9381/18/5/302, in Class. Quantum Grav. (2000).
- [1] **P.G.L. Porta Mana**: *Asymptotic symmetries of anti-de Sitter space in two and three dimensions*, Cagliari University; <https://portamana.org/linko.php?w=thesis.pdf> (2000).

Seminars and posters

- [33] with C. Bachmann, H. Jacobs, S. Buttler, K. Dillen, G. R. Fink, J. Kukolja, A. Morrison: *Graph properties of the functionally connected brain under the influence of Alzheimer's disease*, poster at the 12th Meeting of the German Neuroscience Society (NWG), Göttingen, Germany (2017).
- [32] *Einstein 1905, Euler 1753: the importance of semantics in science*, Forschungszentrum Jülich, Germany (2017).

- [31] with V. Rostami, M. Helias: *Bimodality and inhibition in pairwise maximum-entropy models for neuroscience*, poster at the 9th Bernstein Sparks Workshop, Göttingen, Germany (2016).
- [30] *The relation between theories on different scales: insights from geophysical fluid dynamics*, invited talk at Cagliari University, Italy (2016).
- [29] *In search of a coarser theory of the brain not suggested by finer theories: lessons from continuum thermomechanics*, Forschungszentrum Jülich, Germany (2015).
- [28] *Inference of variable-rate Poisson model from spike-train data: hidden assumptions and approach via exchangeability*, Forschungszentrum Jülich, Germany (2015).
- [27] *Probability relations between neuronal networks and subnetworks*, Forschungszentrum Jülich, Germany (2015).
- [26] *Introduction to probability logic (Bayesian theory) and its use in neuroscience*, Forschungszentrum Jülich, Germany (2015).
- [25] *Geophysical fluid dynamics and coarse-scale brain activity: similarity of problems! similarity of solutions?*, invited talk at the Forschungszentrum Jülich, Germany (2014).
- [24] *And yet it rotates! (The disappearance of rotational momentum on large scales: modelling large-scale water as a fluid with intrinsic spin)*, University of Oxford, UK (2014).
- [23] *Stochastic parametrization of mesoscale eddies: is water at large scales a liquid polymer?*, University of Oxford, UK (2013).
- [22] with L. Zanna: *Developing a stochastic parameterization of mesoscale eddies*, poster at the European Geosciences Union General Assembly, Austria (2013) and the IUGG Conference on Mathematical geophysics, UK (2012).
- [21] *A critique of the maximum-entropy principle by one of its supporters*, invited talk at the 31st International Workshop on Bayesian Inference and Maximum Entropy Methods in Science and Engineering 'MaxEnt 2011', Waterloo, Canada (2011).

- [20] *Vectors and affine forms, straight and twisted: with applications to electromagnetism and general relativity*, Perimeter Institute for Theoretical Physics, Canada (2011).
- [19] *Parallels between truth logic and probability theory (a pseudo-historical, game-theoretic presentation)*, Perimeter Institute for Theoretical Physics, Canada (2010).
- [18] *Metaphysical deductions and assumptions in quantum physics (or: there can't be only particles behind the wave function)*, invited talk, Perimeter Institute for Theoretical Physics, Canada (2008).
- [17] *A historical review of the 'convex approach' to quantum theory, and an overview of the 'probability table' formalism*, invited talk at the workshop 'Operational probabilistic theories as foils to quantum theory', Department of Applied Mathematics and Theoretical Physics, Cambridge University (2007).
- [16] *Plausibility theory as inductive logic*, Stockholm University (2006).
- [15] *A review on non-completely-positive maps and evolution of non-isolated quantum systems*, KTH Royal Inst. of Technology, Stockholm (2006).
- [14] *Gravitomagnetism, and inertia as a real force. (With an appendix on the effects of weightlessness on the human body)*, KTH Royal Inst. of Technology, Stockholm (2005).
- [13] *Probability theory as an extension of formal logic*, KTH Royal Inst. of Technology, Stockholm (2005).
- [12] with G. Björk: *Uncertainty, information and entropy*, invited talk at the 'Ninth International Conference on Squeezed States and Uncertainty Relations', Besançon, France (2005).
- [11] *Non-orthogonality of statistical matrices and violations of the second law of thermodynamics*, KTH Royal Inst. of Technology, Stockholm (2004).
- [10] *Probability tables: the convex approach to quantum theory*, invited talk at the conference 'Quantum Theory: Reconsideration of Foundations – 2', Växjö University (2004).

- [9] *Notes on entropy assignments, statistical mechanics, and convex sets, for classical and quantum mechanics*, Stockholm University(2004).
- [8] *A panoramic picture of modern rational thermodynamics and thermomechanics*, KTH Royal Inst. of Technology, Stockholm (2004).
- [7] *In between classical and quantum systems: Visualising the convex properties of sets of states and measurements*, Stockholm University and KTH Royal Inst. of Technology, Stockholm (2003).
- [6] *On experimental data tables, sets of states and measurement outcomes, distinguishability, and the boundary between classical and quantum systems*, KTH Royal Inst. of Technology, Stockholm (2003).
- [5] *Maximum-entropy method in statistical mechanics and negative temperatures*, KTH Royal Inst. of Technology, Stockholm (2003).
- [4] *Conceptual adequacy of the Shannon entropy in quantum measurements*, KTH Royal Inst. of Technology, Stockholm, and Cagliari University (2002).
- [3] *Reproduction of quantum phenomena by a deck of cards*, KTH Royal Inst. of Technology, Stockholm, and Cagliari University (2002).
- [2] *Tomography of quantum states*, KTH Royal Inst. of Technology, Stockholm, and Cagliari University (2001).
- [1] *Runge-Kutta methods for nonlinear differential equations and Hopf algebras*, KTH Royal Inst. of Technology, Stockholm (2001).