Curriculum Vitae 01/05/2015

Walter H. Aschbacher

from Zurich, Switzerland
http://aschbacher.univ-tln.fr/

Education

Teaching

• **04/2009** Didactics certificate *Mathematik: Neue Wege in der Lehre*, PROLEHRE, Carl von Linde-Akademie, TUM[1]

Research

• **09/2007** Private lecturer,[2] Department of Mathematics, TUM

• **09/2007** Habilitation thesis *Algebraic approach to open quantum systems*, Department of Mathematics, TUM (Chairman: H. Spohn, Jury: G. Friesecke, A. Joye, C.-A. Pillet)

• **04/2001** Doctoral thesis *Large systems of nonrelativistic Bosons and the Hartree equation*, ITP,[3] ETHZ[4] (Advisor: J. Fröhlich, Jury: G.M. Graf, K. Hepp, M. Troyer)

• **11/1995** Diploma in theoretical physics, ETHZ

• **11/1995** Diploma thesis *Geometrical aspects of gauge field theory*, University of Zurich (Advisor: N. Straumann)

• **10/1990 – 09/1995** Studies in mathematics and theoretical physics, ETHZ

Positions

• **09/2011** Full professor of mathematics[5] (position profile: *Mathematical physics of collective phenomena and nonequilibrium systems*), Department of Mathematics and Center for Theoretical Physics, UTLN[6] and CPT[7]

• **11/2009 – 10/2011** Visiting researcher, EPP[8]

• **09/2009** Assistant professor (permanent A13),[9] TUM

[1] TUM: Technische Universität München, Garching, Germany
[2] Privatdozent (PD)
[3] ITP: Institut for Theoretical Physics, ETHZ
[4] ETHZ: Swiss Federal Institute of Technology, Zurich, Switzerland
[5] Professeur des universités, CNU Section 25 Mathématiques
[6] UTLN: Université de Toulon, Toulon, France
[7] CPT: Centre de Physique Théorique de Luminy (UMR 7332), Marseille, France
[8] Ecole Polytechnique, Palaiseau, France
[9] Declined.

• **04/2004 – 02/2012** Assistant professor (C1), TUM

• **11/2002 – 12/2002** Visiting researcher, University of Grenoble 1, France

• **10/2001 – 03/2004** Postdoctoral researcher, UTLN and CPT

• **06/1998 – 08/1998** Visiting researcher, Rutgers University, USA

• **04/1996 – 10/2001** Doctoral student/teaching assistant, ITP, ETHZ

• **10/1995 – 03/1996** Teaching assistant, SAM[10]

Awards

• **11/2010** DFG[11] grant *AS 355/1-2 Spectral analysis of mathematical models in quantum field theory*, 2010 – 2011

• **11/2009** DFG grant *AS 355/1-1 Spectral analysis of mathematical models in quantum field theory*, 2009 – 2010

• **04/2003** SNF[12] fellowship *PBEZ2 100853 Properties of steady states for finite systems coupled to thermal reservoirs in non-equilibrium quantum statistical mechanics*, 2003 – 2004

• **10/2002** CNRS[13] grant *D.R. associé*, 2002 – 2003

Service

• **04/2015 – . . .** Vice President for International Affairs[14], UTLN

• **03/2015 – . . .** Member of the University Board of Governors, UTLN

• **10/2014 – . . .** Head of the Departement of Mathematics[15], UTLN

• **05/2014 – . . .** Member of the Laboratory Board, CPT

• **09/2013 – . . .** Director of graduate studies *Master of Mathematics*[16], UTLN

• **09/2013 – . . .** Head of graduate studies *Master of Mathematics 2*, UTLN

• **04/2009 – 10/2009** Member of the Faculty Board, TUM

[10] SAM: Seminar of Applied Mathematics, ETHZ
[11] DFG: German Research Foundation
[12] SNF: Swiss National Science Foundation
[13] CNRS: French National Center for Scientific Research
[14] See *http://www.univ-tln.fr*
[15] See *http://sctech.univ-tln.fr*
[16] See *http://master-math.univ-tln.fr*

Teaching

Mathematics[17]

- **02/2015 – 06/2015** Fonctions analytiques (L3 Math), UTLN
  Distributions (M1 Math), UTLN
- **09/2014 – 01/2015** Groupes de Lie (M1 Math), UTLN
  Théorie des opérateurs (M2 Math), UTLN
- **02/2014 – 06/2014** Fonctions analytiques (L3 Math), UTLN
  Distributions (M1 Math), UTLN
- **09/2013 – 01/2014** Statistiques (L2 Bio), UTLN
  Groupes de Lie (M1 Math), UTLN
  Théorie des opérateurs (M2 Math), UTLN
- **02/2013 – 06/2013** Fonctions analytiques (L3 Math), UTLN
  Distributions (M1 Math), UTLN
- **09/2012 – 01/2013** Statistiques (L2 Bio), UTLN
  Groupes de Lie (M1 Math), UTLN
  Théorie des opérateurs (M2 Math), UTLN
- **02/2012 – 06/2012** Statistiques (L2 Bio), UTLN
  Fonctions analytiques (L3 Math), UTLN
- **09/2011 – 01/2012** Groupes de Lie (M1 Math), UTLN
  Théorie des distributions (M1 Math), UTLN
- **04/2009 – 09/2009** *Höhere Mathematik 2 für Maschinen-/Chemieingenieurwesen*, TUM
- **10/2008 – 03/2009** *Höhere Mathematik 4 (Analysis 3) für Physiker*, TUM
- **04/2008 – 09/2008** *Höhere Mathematik 3 (Analysis 2) für Physiker*, TUM
- **10/2007 – 03/2008** *Höhere Mathematik 2 (Analysis 1) für Physiker*, TUM
- **04/2007 – 09/2007** *Höhere Mathematik 2 für Maschinen-/Chemieingenieurwesen*, TUM
- **10/2006 – 03/2007** *Höhere Mathematik 1 für Maschinen-/Chemieingenieurwesen*, TUM
- **04/2006 – 09/2006** *Höhere Mathematik 3 (Analysis 2) für Physiker*, TUM
- **10/2005 – 03/2006** *Höhere Mathematik 4 (Analysis 3) für Physiker*, TUM
- **04/2005 – 09/2005** *Höhere Mathematik 3 (Analysis 2) für Physiker*, TUM
- **10/2004 – 03/2005** *Höhere Mathematik 2 (Analysis 1) für Physiker*, TUM
- **04/2004 – 09/2004** *Höhere Mathematik 3 (Analysis 2) für Physiker*, TUM
- **10/1995 – 03/1996** *Lineare Algebra*, SAM

[17] For more detailed information, see **teaching** on *http://aschbacher.univ-tln.fr*.

Theoretical physics

- **10/1999 – 03/2000** *Quantenmechanik I*, ITP
- **10/1998 – 03/1999** *Theorie der Wärme*, ITP
- **10/1997 – 03/1998** *Quantenmechanik I*, ITP
- **04/1997 – 09/1997** *Allgemeine Relativitätstheorie*, ITP
- **10/1996 – 03/1997** *Klassische Mechanik*, ITP
- **04/1996 – 09/1996** *Quantenmechanik II*, ITP

Talks

Conferences/Workshops/Schools[18]

- **11/2011** *Quantum Transport Days*, CPT
- **12/2010** *Model Equations in Bose-Einstein Condensation*, University of Kyoto, Japan
- **12/2010** *Open Quantum Systems*, University of Grenoble 1, France
- **06/2010** *Matter and Radiation*, Erwin Schrödinger Institute of Vienna, Austria
- **11/2009** *Systèmes quantiques ouverts*, University of Cergy-Pontoise, France
- **10/2008** *Forschung live.*, TUM
- **07/2008** *Open quantum systems*, University of Nancy, France
- **03/2008** *Electromagnetic fields created by antennas*, University of Aalborg, Denmark
- **02/2008** *Systèmes ouverts et hors équilibre*, University of Orléans, France
- **06/2007** *Meeting on large quantum systems*, University of Warwick, England
- **11/2006** *Open Systems Days*, CPT
- **09/2006** *Transport and Spectral Problems in Quantum Mechanics: a conference in honor of Jean-Michel Combes*, University of Cergy-Pontoise, France
- **09/2004** *Mathematical Physics Days XI*, University of Leuven, Belgium
- **03/2003** *Statistical Mechanics and Probability Theory*, CIRM[19]

Seminars

- **10/2011** CPT
- **05/2011** Department of Mathematics, UTLN
- **04/2011** CPT
- **12/2010** Department of Mathematics, University of Okayama, Japan
- **11/2010** Laboratoire de Mathématiques, University of Reims, France

[18] *Invited* contributions only. For selected transparencies, see **talks** on *http://aschbacher.univ-tln.fr*.
[19] CIRM: Centre International de Rencontres Mathématiques, Marseille, France

• **06/2010** Institut Camille Jordan, University of Lyon 1, France
• **05/2010** Institut de Recherche Mathématique, University of Rennes 1, France
• **05/2010** Centre de Mathématiques Appliquées, EPP
• **03/2010** Institut Henri Poincaré, University Paris 6, France
• **02/2010** Centre de Mathématiques Appliquées, EPP
• **02/2010** Department of Mathematics, University of Stuttgart, Germany
• **07/2008** Department of Mathematics, University of Tübingen, Germany
• **11/2007** Department of Mathematics, University of Erlangen, Germany
• **10/2007** Institut Jean Lamour, University of Nancy, France
• **06/2007** Department of Physics, Freie Universität Berlin, Germany
• **05/2005** Department of Mathematics, UTLN
• **01/2005** Department of Mathematics, TUM
• **05/2003** Institut de Recherche Mathématique, University of Rennes 1, France
• **03/2003** Department of Mathematics, University of Mainz, Germany
• **12/2002** Laboratoire de mathématiques Jean Leray, University of Nantes, France
• **11/2002** Department of Theoretical Physics, University of Geneva, Switzerland
• **10/2002** Institut Fourier, University of Grenoble 1, France
• **02/2001** CPT
• **02/2001** Ecole Normale Supérieure de Cachan, Paris, France

Projects

Research collaborations[20]

• **01/2013 – 01/2016** ANR[21] *Spectral and scattering theories of quantum field theory models*, France

• **01/2009 – 01/2013** ANR *Hamiltonian and Markovian methods for out of equilibrium quantum mechanics*, France

• **01/2004 – 01/2008** ACI[22] *Modélisation stochastique de systèmes hors équilibre*, France and Germany

Launching[20]

• **05/2012 – . . .** Foundation and organisation of *Groupe de Travail en Physique Mathématique de Toulon*, UTLN

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[20] See **projects** on *http://aschbacher.univ-tln.fr*.
[21] *Agence Nationale de la Recherche*, France
[22] *Action Concertée Incitative*, France

• **11/2005 – 07/2009** Foundation and organisation of *Working Group in Mathematical Physics*, TUM

• **06/2002 – 03/2004** Foundation and organisation of *Séminaire de Travail en Physique Mathématique*, CPT

• **03/1992 – 02/1993** Foundation and organisation of *Colloquium Science and Emergence*, ETHZ

Supervision

Master 2
• Ahamada, A. 2015 *From induced representations to relativistics wave equations*, UTLN

• Attard, J. 2014 *Induced representations of the Poincaré group*, CPT

• Fazul, K. 2014 *Approche alternative de la théorie de Tomita-Takesaki*, UTLN

• Lahlouh, N. 2013 *Soliton pour l'équation de Schrödinger non linéaire perturbée par un potentiel extérieur*, UTLN

• Fürst, M. L. R. 2010 *Calculations on primordial nucleosynthesis*, TUM

• Interlandi, G. 2000 *Soliton's dissipation through emission of radiation*, ETHZ

Master 1
• Kuznietsova, I. 2014 *Interacting wedge-local quantum fields in four-dimensional noncommutative Minkowski space*, UTLN

Bachelor 3
• Destabeau, G., Garriguenc, G., and Poirier, P. 2015 *Feynman diagrams for the discrete φ^4-model*, UTLN

Research

The mathematics involved in the following research fields are *functional analysis*, *operator algebras*, *partial differential equations*, *calculus of variations*, *numerical* and *harmonic analysis*, and *differential geometry*.

Research fields
• *Nonequilibrium quantum statistical mechanics*
• *Nonlinear Schrödinger/Hartree equations*
• *Weak nuclear force*
• *Gravitating gauge fields*
• *Dirac-Fock theory*

• **03/2009 – ...** Mourre theory in the spectral analysis of models of the weak nuclear interaction extracted from the Standard Model (*mp*[23]), EPP and TUM

[23] *mp*: mathematics, mathematical physics

• **03/2008 – ...** Nonlinear, nonlocal partial differential equations of Schrödinger/Hartree type (*mp*, *arn*[24]), TUM

• **09/2004 – ...** States, correlations and transport out of equilibrium (*mp*), TUM

• **01/2005 – 06/2005** Stability of Einstein-Yang-Mills-Dilaton solitons (*tp*[25]), TUM

• **11/2003 – 03/2004** Hartree-Fock minimizer of the electron-positron field (*mp*), CPT

• **10/2001 – 03/2004** Nonequilibrium steady states, entropy production (*mp*), CPT

• **06/1998 – 08/1998** Perturbation theory in nonrelativistic quantum electrodynamics (*mp*), Rutgers University, USA

• **04/1996 – 10/2001** Nonlinear, nonlocal partial differential equations of Schrödinger/Hartree type (*mp* und *arn*), ETHZ

• **04/1996 – 10/2001** Return to equilibrium in nonequilibrium quantum statistical mechanics (*mp*), ETHZ

• **07/1995 – 10/1995** Aspects of geometrical gauge field theory (*tp*), University of Zurich

Work

Publications[26]

Nonequilibrium quantum statistical mechanics

• Aschbacher W H 2013 *From the microscopic to the van Hove regime in the XY chain out of equilibrium* Rev. Math. Phys. 25 1330008 1–44 (arXiv:1306.3070)

• Aschbacher W H 2011 *Broken translation invariance in quasifree fermionic correlations out of equilibrium* J. Funct. Anal. 260 3429–56 (arXiv:1103.4512)

• Aschbacher W H 2010 *A remark on the subleading order in the asymptotics of the nonequilibrium emptiness formation probability* Confluentes Math. 2 293–311 (arXiv:1009.1584)

• Aschbacher W H 2007 *On the emptiness formation probability in quasi-free states* Cont. Math. 447 1–16 (mp_arc 07-34)

• Aschbacher W H and Barbaroux J M 2007 *Exponential spatial decay of spin-spin correlations in translation invariant quasi-free states* J. Math. Phys. 48 113302 1–14

• Aschbacher W H, Jakšić V, Pautrat Y, and Pillet C A 2007 *Transport properties of quasi-free fermions* J. Math. Phys. 48 032101 1–28 (mp_arc 06-300)

• Aschbacher W H 2007 *Non-zero entropy density in the XY chain out of equilibrium* Lett. Math. Phys. 79 1–16 (arXiv:math-ph/0603049)

• Aschbacher W H, Jakšić V, Pautrat Y, and Pillet C A 2006 *Topics in nonequilibrium quantum statistical mechanics* Lecture Notes in Mathematics 1882 1–66 (mp_arc 05-207)

[24] *arn*: analytical and computational numerics
[25] *tp*: theoretical physics
[26] See **publications** on *http://aschbacher.univ-tln.fr*.

• Aschbacher W H and Barbaroux J M 2006 *Out of equilibrium correlations in the XY chain* Lett. Math. Phys. 77 11–20 (arXiv:math-ph/0505062)

• Aschbacher W H and Spohn H 2006 *A remark on the strict positivity of the entropy production* Lett. Math. Phys. 75 17–23 (arXiv:math-ph/0507009)

• Aschbacher W H and Pillet C A 2003 *Nonequilibrium steady states of the XY chain* J. Stat. Phys. 112 1153–75 (mp_arc 02-459)

Nonlinear Schrödinger/Hartree equations
• Aschbacher W H 2009 *Fully discrete Galerkin schemes for the nonlinear and nonlocal Hartree equation* Electron. J. Diff. Eqns. 12 1–22

• Aschbacher W H and Squassina M 2009 *On phase segregation in nonlocal two-particle Hartree systems* Cent. Eur. J. Math. 7 230–48 (arXiv:0809.3369)

• Aschbacher W H, Fröhlich J, Graf G M, Schnee K, and Troyer M 2002 *Symmetry breaking regime in the nonlinear Hartree equation* J. Math. Phys. 43 3879–91 (mp_arc 01-188)

Weak nuclear interaction
• Aschbacher W H, Barbaroux J-M, Faupin J, and Guillot J-C 2011 *Spectral theory for a mathematical model of the weak interactions: The decay of the intermediate vector bosons* $W^{\pm}$*, II.* Ann. Henri Poincaré 12 1539–70 (arXiv:1105.2247)

Gravitating gauge fields
• Aschbacher W H 2006 *On the instabilities of static, spherically symmetric SU(2) Einstein-Yang-Mills-Dilaton solitons and black holes* Phys. Rev. D 73 024014 1–5 (arXiv:gr-qc/0509060)

Dirac–Fock theory
• Aschbacher W H 2004 *Lowering the Hartree-Fock minimizer by electron-positron pair correlation* Lett. Math. Phys. 70 29–41 (mp_arc 04-74)

Work in progress

Nonequilibrium quantum statistical mechanics
• Aschbacher W H *Out of equilibrium properties of extended XY models*

• Aschbacher W H *Phase transitions out of equilibrium in L/R-mover systems*

• Aschbacher W H, Jakšić V, Ogata Y, Pautrat Y, and Pillet C A *Fluctuation theorems in quantum statistical mechanics*

Nonlinear Schrödinger/Hartree equations
• Aschbacher W H and Giannoulis J *Deriving the nonlinear vector Schrödinger equation for a gravity surface water wave system*

• Aschbacher W H *On radiative dissipation of Hartree solitons*

Weak nuclear interaction
• Aschbacher W H, Barbaroux J-M, Faupin J, and Guillot J-C *Spectral theory for a mathematical model of the weak interactions: The decay of the muon*

Other

Nonequilibrium quantum statistical mechanics
• Aschbacher W H 2007 *Algebraic approach to open quantum systems* Habilitation thesis, Department of Mathematics, TUM, 1–23

Nonlinear Schrödinger/Hartree equations
• Aschbacher W H 2001 *Large systems of nonrelativistic Bosons and the Hartree equation* Doctoral thesis No. 14135, ETHZ, 1–125

Gravitating gauge fields
• Aschbacher W H 1996 *Geometrical aspects of gauge field theory* Diploma thesis, University of Zurich, 1–70