

# 1. CURRICULUM VITAE



Name: Klaus Morawetz  
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## School education

1970 - 1978 Poly-educational school in Berlin - Oberschöneweide  
1978 - 1982 Extended secondary school *Heinrich Hertz*, élitist school focused on mathematics  
1982 Final examination (Abitur)

## Military service

1982 - 1984 18 month compulsory, basic military service

## Study and Qualification

1984 - 1989 Study of physics at University Rostock with specialization in theoretical physics, many-particle systems  
1987 Study in Jerewan (Armenia)  
1989 Diploma thesis: *Kinetische Theorie partiell ionisierter Wasserstoffplasmen in starken elektrischen Feldern*  
1989 - 1991 Graduate study at University Rostock  
1988/1989/1991 Summerschools: *Quantum statistics* in Flessenow, *Quantum field theory* in Leipzig, *General Relativity* in Jena  
1992 PhD thesis, supervisor Prof. D. Kremp:  
*Properties of partially ionized hydrogen-plasma in high electric fields*  
1998 Habilitation at University Rostock, mentor Prof. G. Röpke:  
*Kinetic theory for strongly interacting Fermi systems*  
30.11.1998 Probe lecture: *Weak chaos and the formation of structure*  
2000 Qualification *aux fonctions de professeur des universités* (France)  
2003 Qualification as *Privatdozent* at Chemnitz University of Technology

## Grants and prizes

1982 First prize in Heinrich-Hertz-Competition (school); 1991, 1995 DAAD grants (Ireland, USA), 1999 CIES grant (France), best publication at Charles University 2008

## Research positions

01.09.1989 - 31.03.1991	Graduate study at University Rostock
01.04.1991 - 31.12.1991	PhD Grant
01.01.1992 - 31.12.1996	Scientific associate in group <i>Theoretical Many- Particle Physics</i> of Max Planck Institute Heidelberg at University Rostock
01.01.1997 - 26.09.1999	Scientific associate at University of Rostock, Department of Physics
27.09.1999 - 17.09.2000	Research invitation (CIES) to LPC-University/GANIL in Caen (FR)
18.09.2000 - 31.03.2003	Research associate at Max Planck Institute (MPIPKS), Dresden
01.04.2003-31.03.2007	Senior Research Associate (Oberassistent C2) at Chemnitz University of Technology
01.04.2007-31.12.2007	Research associate at Chemnitz University of Technology
01.01.2008-14.01.2008	Research associate at MPIPKS Dresden
15.01.2008-31.08.2009	Research associate at Forschungszentrum Rossendorf Dresden
since 01.09.2008	Guest professor at ICCMP/Brasília (now IIP/Natal) in Brazil
since 01.09.2009	W2 professorship for Mathematics and Theoretical Many-Body Physics at University of Applied Sciences Münster

## Invitations and experiences abroad

01.09.-18.12.1987	Study at University of Jerewan (Armenien)
August 1991	DAAD language summerschool in Dublin
25.11. - 29.11.1991	Niels Bohr Institute Copenhagen (A. P. Jauho)
27.01. - 07.02.1992	Niels Bohr Institute Copenhagen (A. P. Jauho)
22.04. - 24.04.1992	<i>Kernfysisch Versneller Instituut</i> Groningen (R. Malfliet)
1993 - 1994	several days each year at Niels Bohr Institute Copenhagen and NORDITA
27.03. - 30.04.1995	Tennessee Technical University (S. Ayik)
01.05. - 31.05.1995	University of Arizona (S. Köhler)
31.05. - 20.08.1995	NSCL - Michigan State University (P. Danielewicz)
24.05. - 01.06.1997	NSCL - Michigan State University (P. Danielewicz)
08.06. - 15.06.1997	SUNY - New York State University (P. Paul, G. Brown)
05.10. - 24.10.1997	LNS-INFN Catania (M. DiToro)
19.06. - 26.06.1998	NSRL - University of Rochester (U. Schroeder)
11.04. - 16.04.1999	GANIL Caen (Ph. Chomaz, F. Gulminelli)
01.07. - 09.07.1999	LPC-ISMRA Caen (B. Tamain, F. Gulminelli)
27.09.1999 - 17.09.2000	LPC-ISMRA Caen (B. Tamain)
05.02.-12.02.2006	University of Arizona (N. Kwong, S. Koehler)
1995-2009	Several weeks each year at Institute of Physics, Academy of Sciences, Prague (P. Lipavský)
since 2008	Guest professor at ICCMP/Brasília now IIP/Natal in Brazil

## Publications

180	total
14	monographs (3), books (2), edited books (4), chapter in books (5)
141 (+2)	in refereed journals (80 Phys.Rev.A,B,C,E; 6 Phys.Rev.Lett./rap.comm.)
37	conference proceedings
21	Hirsch-index (google scholar)
appr. 10/year	referee reports (Phys. Rev. B,C,E, Lett., J. of Phys.)
254	talks
210	posters

## Teaching

WS/SS 1989/90	Seminar <i>Theoretical Physics</i> for engineers, 4 h /week (60h)
WS 1992/93	Lecture <i>Vielteilchentheorie dichter Kernmaterie</i> , 1 h/week (15h)
SS 1993	Lecture <i>Exakt lösbar Modelle der Quantenstatistik vieler Teilchen</i> , 2 h/week (30h)
SS 1993	1 week intensive course <i>Exakt lösbar Modelle der Quantenstatistik vieler Teilchen</i> , 20 h
SS 1993	Seminar <i>Physics</i> for physicians, 2 h/week (30h)
Summer 1993	Seminar during summerschool <i>Quantenstatistik</i> , 6h
WS 1993/94	Lecture <i>Exakt lösbar Modelle der Quantenstatistik vieler Teilchen, part 2</i> , 2 h/week (30h)
WS 1993/94	Seminar <i>Ethik und Wissenschaft</i> , 2 h/week (30h), together with K. M. Bull (Theology)
SS 1994	Lecture <i>Quantenelektrodynamik als Einführung in die Theorie der Elementarteilchen</i> , 2 h/week (30h)
WS 1994/95	Lecture <i>Quantenfeldtheorie</i> , 2 h/week (30h)
WS 1994/95	Seminar <i>Physik und Philosophie</i> , 1 h/week (15h)
WS 1996/97	Seminar <i>Physik und Philosophie</i> , 2 h/week (30h)
SS 1999	Lecture Studium Generale <i>Physik und Philosophie</i> , 2 h/week (30h), together with M. Vogt
SS 2002-SS 2003	Ring-Lecture <i>Aspekte der Zeit</i> , 1h/week, together with J. M. Rost (MPI) and J. Klose (Kathedralforum), <i>Studium Generale</i>
SS 2003/04/05/07	Exercises for <i>Thermodynamics and statistical Physics</i> , Computational Physics Bachelor, 2 h/week (60h)
WS 2003/04/05	Exercises for <i>Mechanics of continua</i> , Physics Diplom, 2 h/week (60h)
SS 2004/05/06/07	Lecture <i>Quantum mechanics II (Nonequilibrium quantum statistics of many particles)</i> , physics diplom, 4h/week (120h)
WS 2004/05/06	Lecture <i>Quantum mechanics II (Field theory)</i> , physics diplom, 4h/week (120h)
since 2002	Education for teacher, lectures at schools (see appendix)
WS 2009-now	Mathematics I,III, physics bachelor, 11h/week
SS 2010-now	Mathematics II, physics bachelor, 6h/week
WS 2010-now	Theoretical Optics, physics master, 6h/week
SS 2011-now	Physics II, bachelor, 6h/week
SS 2012-now	Statistical Physics 4h/week

## Supervised project, diploma, master, PhD students

1. R. Walke, September 1994, project work: *Gedächtniseffekte in stark korrelierten Plasmen*
2. R. Walke, September 1994, diplom: *Die Quanten-Vlasov-Gleichung und ihre Anwendung auf Kernstöße*
3. U. Fuhrmann, 1995, project work: *Spektrale Eigenschaften des Luttinger Modells*
4. U. Fuhrmann, 1996, diplom: *Der Einfluß von Stößen auf die Dämpfung von Riesenresonanzen*
5. M. Vogt, 1997, diplom: *Der Einfluß chaotischer Dynamik auf die Dämpfung von Riesenresonanzen*
6. R. Walke, 1997, PhD: *Simulation von Riesenresonanzen in endlichen Kernen fernab vom Gleichgewicht*
7. U. Fuhrmann, 1999, PhD: *Damping of Giant Resonances*
8. C. Olbrich, 2004, bachelor: *Modelation of surface covering with Ising models*

9. B. Schmidt, 2004, diplom: *Two-particle scattering on realistic nanostructures*
10. C. Olbrich, 2006, master: *Transport in correlated quasi-2D electron systems*
11. M. Maennel, 2007, diplom: *Equation of state of interacting Bose systems*
12. T. Zimmermann, 2009, BELL project work: *Modelle und Entwicklung dichter Sterne*
13. M. Maennel, 2011, PhD: *Condensation phenomena in interacting Bose and Fermi systems*
14. C. Schäfermeier, 2012, Master (Rincklake prize for best master thesis at FH): *Towards quantum key distributions in atmospheric channels*
15. 2 Bachelor p.a.

## Organization of conferences and workshops

1. *First workshop on nonequilibrium physics at short time scales*  
Rostock, 10.1.-12.1.1994 (supported by Max Planck Society (MPG) with 3 kDM)
2. *Heraeus Ferienkurs: Quantenstatistik Rostock*, 14.9.-20.9.1994 (partial organizer)
3. *144. WE Heraeus Seminar: Workshop on nonequilibrium physics at short time scales*  
Rostock, 11.1.-14.1.1995, (10 kDM)
4. *Third workshop on nonequilibrium physics at short time scales*  
Rostock, 28.2.-1.3.1996 (MPG supported with 4 kDM)
5. *Fourth workshop on nonequilibrium physics at short time scales*  
Rostock, 7.4.-11.4.1997, (DFG supported with 10 kDM)
6. *Fifth workshop on nonequilibrium physics at short time scales*  
Rostock, 27.4.-30.4.1998 (DFG supported with 10 kDM)
7. *Workshop on Kadanoff - Baym Equations - Progress and Perspectives for Many - Body Physics*, Rostock, 20.9.-24.9.1999 (partial organizer)
8. *Sixth workshop on nonequilibrium physics at short time scales*  
Dresden, 29.5.-23.6.2000 (Max Planck Institute for the Physics of Complex Systems, 20 kDM)
9. *Formation of Correlations* (Seventh workshop on nonequilibrium physics at short time scales)  
Bonn, 24.6.-28.6.2002 (WE-Heraeus Foundation, 30 kDM)
10. *Off-Shell Effects in Quantum Transport* (Eighths workshop on nonequilibrium physics at short time scales) Dresden, 4.5.-16.5.2003 (MPIPKS, 20KEuro)
11. *Lehrertag Dresden* DPG-Spring meeting of solid state physics section, Dresden, 28.3.-29.3.2003
12. *Lehrertage* 2004, 2005 Teachers education network Saxony
13. *Nonequilibrium Nanostructures* (Nineth workshop on nonequilibrium physics at short time scales) MPIPKS and Forschungszentrum Dresden-Rossendorf, 1.12.-6.12.2008 (DFG supp. with 20 kEuro, Saxonian Ministry with 6 kEuro, ICCMP Brasilia with 5 kEuro)
14. *Novel approaches to pairing and condensation*, MPIPKS, 2.10.-4.10.2009, (MPI supp. with 1 kEuro)
15. *Ultracold Quantum Gases beyond Equilibrium*, Natal, 27.9.-1.10.2010, (IIP Natal, about 30 kEuro)
16. *Finite systems in Nonequilibrium: From quantum quench to the formation of strong correlations*, Natal, 10.9.-30.9.2017, (IIP Natal, about 20 kEuro)
17. *Correlations and transport in one-dimensional structures*, Dresden, 4.7.-6.7.2019, (TU Dresden, about 10 kEuro)

## Successful projects

1. 1994-2009 9 workshops: *Nonequilibrium at short time scales* (120 kEuro)
2. 1994-1997 BMFT - Project (06R0745(0)): *Calculation of energy loss and stopping power in nonequilibrium* (40 kDM/year)
3. 1997-1999 DFG project (R0 905 (13-1)): *Damping of giant resonances*, (60 kDM/year)
4. 1997-1999 BMFT - Project (06R0884): *Nichtlinearer Transport und Instabilitäten bei der Wechselwirkung von Schwerionenstrahlen mit Plasmen*, (45 kDM/year)
5. 1998-1999 Heisenberg-Landau Program: *Anharmonic Effects in metal clusters*, (3kDM/year)
6. 2001-2002 Organization of international working group *Formation of correlations and superconductivity* <http://www.mpipks-dresden.mpg.de/morawetz/work.html>, (70 man days/year)
7. 2002-2003 Ring-lecture: *Aspects of time*, (supported by Saxony ministry of education with 70 kDM)
8. 2004-2005 Project Based Personnel Exchange Program with Czech Republic, *Non-equilibrium many-body systems with strong correlations*, (DAAD, 10 kEuro)
9. 2004-2006 Teachers education network Saxony, (Bosch foundation, 10 kEuro)
10. 2006-2008 Project Based Personnel Exchange Program with Czech Republic, *Interaction of superconductivity with lattice and structure deformations* (DAAD, 12 kEuro)
11. 2009-2012 DFG-CNPq project 444BRA-113/57/0, *Strongly interacting condensed phases of fermions and bosons in nanostructures and atomic traps*, (DFG 22kEuro)
12. 2009-2013 FP7-PEOPLE-2009-IRSES, *Spin related phenomena in mesoscopic transport-(SPINMET)*, coordinator: I. Shelykh, (EU 396kEuro)
13. 2010-2012 Project Based Personnel Exchange Program with Czech Republic, *Dynamics of superconductivity and crossover to Bose-Einstein condensation* (DAAD, 12 kEuro)
14. 2010-2012 Project Based Personnel Exchange Program with Norway, *Formation of brine channels in sea ice* (DAAD, 12 kEuro)
15. 2010-2012 TVL13/2 research position by innovation fond FH Münster (50 kEuro)
16. 2010-2011 Mathematica-lab by teaching fond FH Münster (24 kEuro)
17. 2011-2013 DFG Project (in SPP 1158): *Formation of brine channels in sea ice* (150 kEuro)
18. 2012 FH-Basis program of NRW Ministry: *SUPRASPINANO - parallel cluster* (75 kEuro)
19. 2017 DFG-INSRA project with Panjab University (India): *Critical temperature of strongly interacting Bosons in nanostructures* (2kEURO)
20. 2018 DFG-INSRA project with Panjab University (India): *One-dimensional Interacting Electron Fluids and the Formation of Strong Correlations*(30kEURO)

## Experiences in commissions of University

1989-1991	Commission <i>Studium Generale</i> , University Rostock
1990-1993	University council University Rostock
1990-1993	Council of mathematical - natural science faculty University Rostock
1991-1993	Election into the evaluation commission of the University Rostock
1992-1994	Executive committee of the university council University Rostock
1990-1994	Council of department of Physics University Rostock
2015-	Council of department of Physics Münster University (FH)
2018-	Vice-Dean of department of Physics Münster University (FH)

## Further activities

1976-1988	Study of classical guitar (teacher: M. Fahr, A. Quadt)
1984-1992	Catholic student group
1989-1993	Foundation and editor of student newspaper <i>STUF</i>
1994	Foundation of the interconfessional university group Rostock
1995-1999	Board of <i>Thomas Morus Bildungswerk</i> , Mecklenburg-Vorpommern
2000	Coworker <i>Kathedralforum</i> , catholic academy of Dresden-Meissen
2003	Foundation of <i>AgricolaFORUM</i> Chemnitz

## Languages

English:	6 years school, $2\frac{1}{2}$ years University SKA IIa, $1\frac{1}{2}$ years University SKA III, 4 weeks summerschool in Dublin, 7 months stay in U.S.A.
Russian:	8 years school, $2\frac{1}{2}$ years University SKA IIb, 4 months study in Armenia,
French:	1 year Caen (France), course at University Caen (A3,B2)
Spanish:	$1\frac{1}{2}$ years University basic level
Portuguese:	since 2009 various courses in Brasilia, Natal (Brazil)

## Selected publications (complete and accessible: <http://www.k-morawetz.de>)

### Monographs

- *Bernoulli potentials in superconductors - how electric fields help to understand superconductivity*, Lecture notes in Physics 733, Springer Verlag Berlin (2007), ISBN 978-3-540-73455-0, P. Lipavský, J. Kolaček, K. Morawetz, E. H. Brandt, T. Yang, 280 pages
- *Interacting Systems far from Equilibrium – Quantum Kinetic Theory*, Oxford University Press (2017), ISBN: 9780198797241, K. Morawetz, 525 pages

### Plasma Physics

- 21 Phys. of Fluids **B 1** (1994) 225-235: *Collective excitations and optical bistability in partially ionized Hydrogen-plasmas due to high electric fields*, K. Morawetz, D. Kremp
- 59 Phys. Rev. **E 62** (2000) 6135-6149, errata: Phys. Rev. E 69, 029902(E): *Nonlinear relaxation field in charged systems under high electric fields*, K. Morawetz

### Nuclear Physics

- 64 Phys. Rev. **C 63** (2001) 034619-1-13: *Mid-rapidity charge distribution in peripheral heavy ion collisions*, K. Morawetz, P. Lipavský, J. Normand, D. Cussol, J. Colin, B. Tamain

### Solid State Physics

- 110 J. Stat. Phys. 143 (2011) 482-500: *Asymmetric Bethe-Salpeter equation for pairing and condensation*, K. Morawetz
- 115 Phys. Rev. **A 87** (2013) 053617-1-7: *Coexistence of phase transitions and hysteresis near BEC*, M. Männel, K. Morawetz, P. Lipavský
- 120 Phys. Rev. **B 90** (2014) 075303-1-9: *Universal short-time response and formation of correlations after quantum quenches*, K. Morawetz
- 124 Phys. Rev. **B 94** (2016) 165415-1-16: *Dynamical charge and pseudospin currents in graphene and possible Cooper pair formation*, K. Morawetz
- 130 Phys. Rev. **E 96** (2017) 032106, 1-17: *Nonequilibrium thermodynamics with binary quantum correlations*, K. Morawetz

### Relativity and Quantum Optics

- 136 Phys. Rev. **B 99** (2019) 205124-1-12: *Bose condensation of squeezed light*, K. Morawetz
- 139 Class. Quantum Grav. **38** (2020) 205003: *Consistent solution of Einstein-Cartan equations with torsion outside matter*, K. Morawetz