

Curriculum Vitae

Prof. Dr. Jörg Schmalian

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Jörg Schmalian is professor of theoretical physics at the Karlsruhe Institute of Technology, working on the quantum physics of electrons in strongly correlated materials. He and his research team develop theories for quantum materials with novel electric, optic, or magnetic properties. With his collaborators he predicted the recently observed electron hydrodynamics in graphene, formulated the theory of nematic order and fluctuations in iron-based and topological materials, advanced the theory of unconventional superconductivity, and worked on the theory of the glass transition.

EMPLOYMENT HISTORY

Visiting Appointments

- Visiting Professor, Stanford University, USA (Spring 2019)
- Visiting Professor, University Paris Diderot-Paris 7, France (Spring 2015)
- Visiting Professor, Royal Holloway University of London, UK (2010)

06/2011 – Present

Professor | Karlsruhe Institute of Technology, Karlsruhe, Germany

- Chair, Department of Physics (2021 – present)
- Head, Theory Division, Institute for Quantum Materials and Technol. (2020 – present)
- Head, Theory Group, Institute for Solid State Physics (2013 – 2019)
- Head, Institute for Theory of Condensed Matter (2011 – 2021)

08/1999 – 05/2011

Professor | Iowa State University

Senior Physicist | US Department of Energy Ames Laboratory, Ames, IA, USA

- Professor, Department of Physics and Astronomy, Iowa State University (ISU) and Senior Physicists of the US-DOE Ames Laboratory (2007 – 2011)
- Associate Professor, ISU and Physicist of the Ames Laboratory (2002 – 2007)
- Assistant Professor, ISU and Associate Physicist of the Ames Laboratory (1999 – 2002)

02/1999 – 07/1999

Atlas Fellow | Rutherford Appleton Laboratory, Oxfordshire, UK

- Fellow of St. Catherine's College in the University of Oxford
- Permanent Scientific Staff, Theory Division, ISIS Neutron Facility, Rutherford Appleton Laboratory

01/1997 – 01/1999

Postdoc | University of Illinois at Urbana-Champaign, Urbana, IL, USA

- Postdoctoral Research Associate and Visiting Research Assistant Professor (supported by the NSF Science and Technology Center for Superconductivity). Advisor: David Pines

01/1994 – 12/1996

Postdoc | Freie University Berlin, Germany

- Postdoc, incl. 12-month visit at CNRS Grenoble, France. Advisor: Karl Bennemann

EDUCATION

03/1990 – 06/1993

Freie University Berlin | Berlin, Germany

PhD in Physics (Dr. rer. nat.) graduated with *summa cum laude*

Supervisor: Professor Dr. Karl Bennemann

Thesis Title: Theory of strongly correlated high-temperature superconductors

09/1985 – 02/1990

Technical University Merseburg | Merseburg, Germany

University of Leipzig | Leipzig, Germany

Diploma in Physics graduated in Merseburg with *very good*

Supervisors: Dr. Semjon Stepanow, Professor Dr. Horst Schneider

Thesis Title: Phase transitions in liquid-crystalline side chain polymers

HONORS

- 2023: Dresden Physics Award (Physik-Preis Dresden) of the Max Planck Institute for the Physics of Complex Systems and Technical University Dresden for outstanding researchers whose research is of particular interest to scientists in Dresden.
- 2022: John Bardeen Prize for theoretical work on superconductivity, shared with P. Hirschfeld and M. Randeria. The citation of the award reads:
For pioneering theoretical work that has provided significant insights on the nature of superconductivity, its realization in strongly correlated systems, and experimental probes of unconventional superconductors.
- 2020: Election, Honorary Member of the Aspen Center for Physics, Aspen, CO, USA
- 2018: Election, Member of the Heidelberg Academy of Sciences, Heidelberg, Germany
- 2017: Lecturer, Colloquium Ehrenfestii, Instituut-Lorentz, Leiden University, Netherlands
- 2015: Department's Teaching Award of the President's Office of the Karlsruhe Institute of Technology for exceptional teaching in Theoretical Physics
- 2013: Election to the Berlin Scientific Society (Berliner Wissenschaftliche Gesellschaft), Berlin, Germany
- 2013, 2015, and 2018: Award of the Department of Physics, Karlsruhe Institute for Technology for Best Lecture in Theoretical Physics at the Master Level
- 2012, 2014, and 2021: Award of the Department of Physics, Karlsruhe Institute for Technology for Best Lecture in Theoretical Physics at the Bachelor level
- 2010, 2009 and 2007: *Graduate Teaching Award*, Dept. of Physics and Astronomy, Iowa State University. The recipient is selected by the graduate students of the department as "best classroom teacher".
- 2007: Recipient of the Iowa State University College of Liberal Arts and Sciences *Mid-Career Award for Excellence in Research*
- 2006: Fellow of the American Physical Society. The citation of the award reads:
For pioneering contributions to the theory of strongly correlated materials, including studies on the role of disorder, frustration and unconventional pairing in quantum many-body systems
- 2003: Recipient of the Iowa State Foundation *Award for Early Achievement in Research*
- 1999: ATLAS Fellow, St. Catherine's College in the University of Oxford, UK
- 1994: Recipient of the *Carl Ramsauer Research Award* of the AEG / Daimler Benz Corporation for outstanding Ph.D. thesis at a University in Berlin, Germany

SERVICE OF PROFESSIONAL INVOLVEMENT: coordinated grants, advisory boards, panels

- Editor in Chief, *Advances in Physics*, (2022 – present)

- Award Committee, McMillan Award for outstanding young researchers in condensed matter physics (2021 – 2025)
- Election (2015) and re-election (2019) to as well as chair (2022 – 2024) of the Review Board “Theoretical Physics of Condensed Matter” of the German Science Foundation (DFG) (2016–2024)
- External Review Board for Tenure Track appointments in the sciences, Goethe University Frankfurt (2021 – 2027)
- Co-Spokesperson, Collaborative Research Center TRR-288 Elasto-Q-Mat (2020 – present)
- Spokesperson, European Union’s Horizon 2020 research and innovation network program Hydrotronics (2019 – 2023)
- Advisory Board, Cluster of Excellence, Complexity and Topology in Quantum Matter, Dresden-Würzburg, Germany (2019 – 2026)
- European Research Council’s Consolidator Grant Panel on Condensed Matter Physics (2021–2022)
- Scientific Advisory Board, Max-Planck-Institute for Solid-State Physics, Stuttgart, Germany (2017 – 2022)
- Award Committee, Bardeen Prize for the Theory of Superconductivity (2018)
- Review panel of the Leibniz Institute for Solid State Research (IFW) in Dresden, Germany (2014 and 2021)
- Review panel (chair) of the Department of Physics and Earth Sciences, University of Leipzig, Germany (2013 and 2016)
- Treasurer (2013 – 2017), Trustee (2008 – 2015), Scientific Secretary (2007/2008), and General Member (2005 – 2020) of the Aspen Center for Physics, Aspen, CO, USA
- Member, Postdoctoral Fellowship Committee, German Academic Exchange Service, DAAD, (2011– 2015)
- Reviewer, Program Review Division of Materials Science and Engineering at DOE Brookhaven National Laboratory, USA (2011) and at DOE Oak Ridge National Laboratory, Oak Ridge, TN, USA (2009)
- Science Steering Committee (2003 – 2011) and Executive Committee (2012 – 2014) of the Institute for Complex Adaptive Matter, University of California, USA

ORGANIZATION OF CONFERENCES, WORKSHOPS, AND SCHOOLS

- Chair, Gordon Research Conference, *Superconductivity; Interactions, Topology and Applications*, April 30 – May 05, 2023, Les Diablerets, VD, Switzerland
- Organizer, workshop and seminar *Elastic Manipulation and Dynamics of Quantum Materials* at the Max Planck Institute for Physics of Complex Systems, July 31– August 11, 2023, Dresden, Germany
- Organizer, Les Houches summer school: *Frontiers of Condensed Matter*, October 10 – 21, 2022, Les Houches, France.
- Organizer, SPICE workshop *Elastic Tuning and Response of Electronic Order*, December 09 – 11, 2019, Mainz, Germany
- Organizer, *The David Pines Symposium on Superconductivity Today and Tomorrow*, March 29 – 30, 2019, Urbana, IL, USA
- Organizer, *Emergence in disordered, interacting and living systems: Abrahams@90*, August 12, 2017, Aspen, CO, USA
- Chair, Gordon Research Conference, *Correlated Electron Systems, Textures and Topology in Electron Systems*, June 22 – 27, 2014, Mount Holyoke College, South Hadley, MA, USA
- Organizer, *International Summer School, Superconductivity – Theory, Experiments, and Phenomena*, August 5 – 17, 2013, Cargèse, France
- Organizer, workshop *Electronic Correlations and Disorder in Quantum Matter* dedicated to Peter Wölfle’s 70th birthday, March 31 – April 3, 2012, Karlsruhe, Germany
- Organizer, Aspen Winter Conference *Contrasting superconductivity in cuprates and pnictides*, January 22 – 27, 2011, Aspen, CO, USA

- Organizer, 2010 Summer Workshop Series, *Condensed Matter Physics in the City*, July 05– 30, 2010, London, U.K
- Organizer, ICAM conference *The superfluid universe*, August 17– 19, 2007, Snowmass, CO, USA
- Organizer, workshop *Complexity in correlated electron systems*, June 2005, KITP Santa Barbara, CA, USA
- Organizer, workshop *Structure, correlations and dynamics in glasses*, August 2005, Aspen, CO, USA
- Organizer, workshop *Electronic systems with slow, frustration driven dynamics*, December 11– 14, 2003, San Diego, CA, USA
- Organizer, symposium *Strongly Correlated Electrons in High- T_c Superconductors*, 1996, Berlin, Germany

TRAINING OF DOCTORAL STUDENTS AND POSTDOCS

(subset with ongoing academic career, shows current position)

- Roland Willa (postdoc: 2018-2022) Professor, University of Applied Sciences, Sion, Switzerland
- Egor I. Kiselev (PhD, 2020), postdoc, Technion - Israel Institute of Technology, Haifa, Israel
- Matthias Hecker (PhD, 2019), postdoc, Univ. of Minnesota, Minneapolis, USA
- Julia Link (PhD, 2017), postdoc, Simon Fraser Univ., Burnaby, Canada
- Bhilahari Jeevanesan (PhD, 2016), postdoc, TU Munich, Germany
- Mathias Scheurer (PhD, 2016), Junior Professor, University of Innsbruck, Austria
- Sangwook Wu (PhD, 2005), Professor, Department of Physics, Pukyong National University, South Korea
- Peter Orth (postdoc: 2011 – 2015), Assistant Professor, Department of Physics and Astronomy, Iowa State University, Ames, IA, USA, since 2023 Professor, Saarland University, Saarbrücken, Germany
- Sergey Syzranov (postdoc: 2011 – 2013), Associate Professor, Univ. of California, Santa Cruz, USA
- Rafael Fernandes (postdoc: 2008 – 2011), Associate Professor, University of Minnesota, Minneapolis, USA
- Rastko Sknepnek (postdoc: 2006 – 2009), Senior Lecturer for Physics at the University Dundee, UK
- Daniel Sheehy (postdoc: 2006 – 2007), Professor, Louisiana State University, Baton Rouge, USA
- Maxim Dzero (postdoc: 2003 – 2006), Professor, Kent State University, OH, USA
- Ewelina Hankiewicz (postdoc: 2002 – 2003), Professor, University of Würzburg, Germany
- Harry Westfahl Jr. (postdoc, 1999 – 2002), Professor and Director of the National Synchrotron Laboratory, Campinas, Brazil