



Dipl.-Ing. Dr. rer. nat. Thomas SCHÄFER

HEAD OF THE INDEPENDENT MAX PLANCK RESEARCH GROUP "THEORY OF STRONGLY CORRELATED QUANTUM MATTER" (SCQM)

Max Planck Institute for Solid State Research (MPI-FKF), Heisenbergstr. 1, 70569 Stuttgart
Nationality: Austrian, Date of Birth: 5th April 1987
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Google Scholar: <https://scholar.google.com/citations?user=aJBvSKAAAAAJ&hl=en>

CURRICULUM VITAE AT A GLANCE

POSITIONS HELD AFTER PhD

- 2020 – today **Independent Max Planck Research Group leader** "Theory of Strongly Correlated Quantum Matter"
Max Planck Institute for Solid State Research (MPI-FKF), Stuttgart, Germany
- 2019 – 2020 **Erwin-Schrödinger Fellow** hosted by Prof. Antoine Georges, funded by the FWF
École Polytechnique and Collège de France, Paris, France
- 2017 – 2019 **Postdoctoral Researcher** hosted by Prof. Antoine Georges
École Polytechnique and Collège de France, Paris, France
- 2016 – 2017 **Postdoctoral Researcher** hosted by Prof. Alessandro Toschi
TU Wien, Vienna, Austria

UNIVERSITY EDUCATION

- 2013 – 2016 **Doctor rerum naturalium (PhD)** awarded with highest honors "*sub auspiciis praesidentis rei publicae*"
Thesis "*Classical and quantum phase transitions in strongly correlated electron systems*"
supervised by Prof. Karsten Held and Prof. Alessandro Toschi
TU Wien, Vienna, Austria
- 2010 – 2012 **Mathematical and Theoretical Physics - Master of Science** awarded with highest honors
Thesis "*Electronic correlations at the Two-Particle Level*" supervised by Prof. Alessandro Toschi
TU Wien, Vienna, Austria
- 2007 – 2010 **Technical Physics - Bachelor of Science** awarded with highest honors
Thesis "*Numerical Simulation of μ SR for specific Kondo-systems*" supervised by Prof. Herwig Michor
TU Wien, Vienna, Austria

PUBLICATION and DISSEMINATION OVERVIEW (as of 5th April 2024)

- **30 peer-reviewed Publications:** 1 Nature Communications, 1 Proceedings of the National Academy of Sciences, 2 Physical Review X, 6 Physical Review Letters, 1 Annual Review, 2 Physical Review Research, 1 SciPost Physics, 11 Physical Review B, 5 other journals (see Publication Activities attached)
- **Citations Metrics:** 1,809 citations, h-index 21 (Google Scholar) – 1,122 citations, h-index 18 (Web of Science) – 1,166 citations, h-index 18 (Scopus)
- **Dissemination:** 22 invited and 22 contributed talks at (international) conferences, workshops and seminars, 11 posters
- **Organizer** of the international workshop "Correlations in Novel Quantum Materials" CNQM2021/2022/2023 (100 participants each, 24 speakers each, <https://www.fkf.mpg.de/cnqm2023>)

TEACHING and SCIENTIFIC SUPERVISION

- **Lectures and exercises "Solid State Theory"**, International Master's Program Physics, University of Stuttgart (SS 2022/23)
- Co-lecturer at École Polytechnique (**Advanced Quantum Theory**, 2019) and TU Wien (**Advanced Theory of Superconductivity and Magnetism**, 2016)
- **Request for Habilitation** at the University of Stuttgart (2022)
- Current **supervision** activity 2 PhD students (Erstbetreuer), 1 Master student
- Past (co-)supervision activity 2 Postdocs, 3 Master students, 3 Bachelor students, 4 internship students

FUNDING OF approx. 1.6M EUR

- 2020 – today Independent Max Planck Research Group | Budget: 1.4M EUR for 5 years | Max Planck Society
- 2022, 2023 Workshop "Correlations in Novel Quantum Materials" | Budget: 42k USD | ICAM
- 2019 – 2020 Erwin-Schrödinger Fellowship | Budget: 160k EUR | Austrian Science Fund (FWF)
- 2017 Excellence Scholarship of the Austrian Federal Ministry of Education, Science and Research | Budget: 9k EUR | Austrian Federal Ministry of Education, Science and Research

AWARDS and OTHER SCIENTIFIC ACTIVITIES OVERVIEW

- Principal Investigator Max-Planck Graduate Center for Quantum Materials
- Principal Investigator of the International Max-Planck Research School for Condensed Matter Science
- External Reviewer for the National Science Center, Poland and Agence nationale de la recherche (ANR), France
- Referee for Nature, Nature Communications, Physical Review Letters, Physical Review B, Europhysics Letters, Physica Status Solidi and SN Applied Sciences
- Regular mid-term stays at the Center for Computational Quantum Physics (CCQ), Flatiron Institute, New York, USA
- "Emerging Leader" 2020 by the Journal of Physics, Condensed Matter
- Award for an outstanding and excellent diploma thesis of the City of Vienna 2013



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CURRICULUM VITAE

RESEARCH INTERESTS

Strongly Correlated Electron Systems

- Cuprates, ruthenates, nickelates, organic superconductors, (twisted) transition metal dichalcogenides, heavy fermions
- Mott-Hubbard metal-insulator transition
- Physics of the Hubbard model
- Low-dimensional systems
- Spin-orbit coupling

Frustrated Magnetic Systems

- Geometric frustration
- Metal-insulator transitions
- Chirality

Quantum Criticality

- Quantum and classical critical phenomena
- Quantum magnetism
- Electronic Kohn anomalies

High-temperature Superconductivity

- Pseudogap physics
- Unconventional pairing mechanisms

Quantum Many-Body Techniques

- Multi-method, multi-messenger approach
- Dynamical mean field theory (DMFT)
- Cluster (CDMFT, DCA) and diagrammatic (DGA, TRILEX) extensions of DMFT
- Many-particle Green functions and Luttinger-Ward formalism in the non-perturbative regime
- Fluctuation diagnostics and parquet decomposition

POSITIONS HELD AFTER PhD

2020 – today **Independent Max Planck Research Group leader** "Theory of Strongly Correlated Quantum Matter"
Max Planck Institute for Solid State Research (MPI-FKF), Stuttgart, Germany
hosted by the Max-Planck Institute for Solid State Research (MPI-FKF), Stuttgart (Germany)

appointed ("Ruf") initially for five years by the president of the Max-Planck society (MPG)
following the suggestions of an independent search commission

- Funding: W2 salary for the head of the research group, coverage of one postdoc and one PhD position, competitive research expenditure coverage and initial equipment (spent on HPC cluster "Bordeaux"), amounting to a total budget of approx. 1.4M EUR (five years)
- Permission as a principal supervisor (Erstbetreuer) of PhD students granted by the University of Stuttgart, Member of the PhD Commission of the MPI-FKF
- Principal Investigator Max-Planck Graduate Center for Quantum Materials, <https://www.quantummaterials.mpg.de>
- Principal Investigator of the International Max-Planck Research School for Condensed Matter Science, <https://www.imprs-cms.mpg.de>

2019 – 2020 **Erwin-Schrödinger Fellow** hosted by Prof. Antoine Georges
École Polytechnique and Collège de France, Paris, France

FWF project J-4266, hosted by Prof. Antoine Georges (École Polytechnique and Collège de France, Paris, France with regular visits to the Center for Computational Quantum Physics, Flatiron Institute, New York, USA), principal investigator with a budget of 160k EUR

2017 – 2019 **Postdoctoral Researcher** hosted by Prof. Antoine Georges
École Polytechnique and Collège de France, Paris, France

2016 – 2017 **Postdoctoral Researcher** hosted by Prof. Alessandro Toschi
TU Wien, Vienna, Austria

CURRICULUM VITAE

EDUCATION

- 2013 – 2016 **Doctor rerum naturalium (PhD)** awarded with highest honors "*sub auspiciis praesidentis rei publicae*"
TU Wien, Vienna, Austria
Thesis "*Classical and quantum phase transitions in strongly correlated electron systems*" supervised by Prof. Karsten Held and Prof. Alessandro Toschi
"*Promotio sub auspiciis Praesidentis rei publicae*" on the 05/12/2017 (highest achievable honor for university and school studies, promotion by the federal president of Austria, Dr. Alexander Van der Bellen in person), every final grade in high school and university studies was the highest possible ("sehr gut", 1.0)
funded by Austrian Science Fund Doctoral School "Building Solids for Function",
<http://solids4fun.tuwien.ac.at>
- 2010 – 2012 **Mathematical and Theoretical Physics - Master of Science** awarded with highest honors
TU Wien, Vienna, Austria
Thesis "Electronic correlations at the Two-Particle Level" supervised by Prof. Alessandro Toschi awarded with the Award for an outstanding and excellent thesis of the City of Vienna (2013)
Diploma student funded by the FWF project "Quantum criticality in strongly correlated magnets (QMC)" (I 610-N16) under the supervision of Prof. Alessandro Toschi
- 2007 – 2010 **Technical Physics - Bachelor of Science** awarded with highest honors
TU Wien, Vienna, Austria
Thesis "Numerical Simulation of μ SR for specific Kondo-systems" under the supervision of Prof. Herwig Michor
- 2001 – 2006 **School leaving examinations - Reife- und Diplomprüfung** awarded with highest honors
HTBLuVA St. Pölten (Higher Technical College for Informatics), St. Pölten, Austria
- 1997 – 2001 **Grammar School**
Piaristengymnasium Krems, Krems an der Donau, Austria

REFERENCE CONTACTS AND COLLABORATION PARTNERS

Reference Contacts and Current and Former Collaboration Partners

- **Prof. Antoine Georges** (host Erwin-Schrödinger Fellowship, postdoctoral supervisor; research partner; Director CCQ, Flatiron institute, Collège de France and École Polytechnique)
ageorges@flatironinstitute.org
- **Prof. Karsten Held** (Doktorvater, research partner; TU Wien)
held@ifp.tuwien.ac.at
- **Prof. Andrew J. Millis** (research partner; Columbia University, Co-Director CCQ, Flatiron institute)
amillis@flatironinstitute.org
- **Prof. Bernhard Keimer** (research partner; Director Max-Planck-Institute for Solid State Research)
b.keimer@fkf.mpg.de
- **Prof. Alessandro Toschi** (supervisor Master, co-supervisor PhD thesis, research partner; TU Wien)
toschi@ifp.tuwien.ac.at
- **Prof. Giorgio Sangiovanni** (research partner; University of Würzburg)
sangiovanni@physik.uni-wuerzburg.de
- **Prof. Walter Metzner** (Director Max-Planck-Institute for Solid State Research)
metzner@fkf.mpg.de
- **Prof. Michel Ferrero** (research partner; Collège de France, École Polytechnique, Paris)
michel.ferrero@polytechnique.edu
- **Prof. Philipp Hansmann** (research partner; Friedrich-Alexander-Universität Erlangen-Nürnberg)
philipp.hansmann@fau.de
- **Prof. Sabine Andergassen** (research partner; TU Wien)
sabine.ndergassen@tuwien.ac.at
- **Prof. Markus Aichhorn** (research partner; TU Graz)
aichhorn@tugraz.at

CURRICULUM VITAE

TEACHING

- 2022, 2023 **Lectures and exercises "Solid State Theory"**
International Master's Program in Physics, University of Stuttgart
- 2022 **Start of Habilitation Process**
University of Stuttgart
- 2019 **Exercises on "Advanced Quantum Physics"**
Bachelor Programme, École Polytechnique
- 2018 – 2019 **Supervisor for Projet de Recherche en Laboratoire (PRL)**
École Polytechnique
- 2016 **Lecturer substitute for "Advanced Theory of Superconductivity and Magnetism"**
TU Wien
- 2013 – 2015 **Organizer and teaching assistant** for the lectures "Quantum Theory I" (2013), "Quantum Theory II" (2014) and "Quantum Field Theory for Many-Body Systems" (2015)
TU Wien
- 2009 – 2013 Extensive **Tutoring activities** at the TU Wien (7 distinct subjects)

SCIENTIFIC SUPERVISION

Current supervision activity 2 PhD students (Erstbetreuer), 1 Master student
Past (co-)supervision activity 2 Postdocs, 3 Master students, 3 Bachelor students, 4 internship students

- 2021 – today **Mário Malcolms de Oliveira: "Non-local correlations in frustrated magnetic systems"**
PhD student, SCQM, MPI-FKF
- 2022 – today **Michael Meixner: "Vertex divergencies on the real frequency axis"**
PhD student, SCQM, MPI-FKF, Stuttgart 2022-ongoing
- 2022 – today **Patrick Tschepe: "Interplay of disorder and strong correlations"**
Master Thesis, SCQM, MPI-FKF
- 2023 – 2023 **Dr. Henri Menke**
Postdoc, SCQM, MPI-FKF
now at Max Planck Computing and Data Facility (MPCDF) Garching
- 2020 – 2023 **Dr. Marcel Klett**
Postdoc, SCQM, MPI-FKF
now at Allianz Insurance
- 2020 – 2021 **Michael Meixner: "On the Phase Diagram of the Hubbard-Model in
Real-Space Extensions of Dynamical Mean Field Theory"**
Master Thesis, SCQM, MPI-FKF
- 2022 **Patrick Tschepe: "Non-local correlations in Twisted Moiré Dichalcogenides"**
Bachelor Thesis, SCQM, MPI-FKF
- 2021 **Patrick Tschepe: "The Hubbard dimer in a magnetic field"**
Internship Project, SCQM, MPI-FKF
- 2015 – 2020 (Co-)supervision of 4 Master students, one Bachelor student, 3 internship students

CURRICULUM VITAE

SCIENTIFIC DISSEMINATION

22 invited and 22 contributed talks at (international) conferences, workshops and seminars, 11 contributed posters

Recent Highlights

- 2023 **Correlations and Geometric Frustration – a happy marriage?**
Ringberg Symposium on Exotic States Of Quantum Condensed Matter
- 2022 **Multimethod, multimessenger approaches to strongly correlated systems**
Hauptvortrag (Invited Talk) at DPG Meeting Regensburg
- Multimethod, multimessenger approaches to strongly correlated systems**
Physikalisches Kolloquium Tübingen, Germany
- It Takes Two to Tango - Condensed Matter Physics Beyond Single-Particle Quantum Mechanics**
Trinity College Science Society, Cambridge University, United Kingdom
- 2021 **How to Read between the Lines of Electronic Spectra: the Diagnostics of Fluctuations in Strongly Correlated Electron Systems**
Collège de France, Public Seminar, Paris, France
- Taking locality to the next level: vertex-based extensions of DMFT and their application**
Stuttgarter Physikalisches Kolloquium, Stuttgart, Germany

FUNDING

- 2020 – today **Independent Max Planck Research Group | Budget: 1.4M EUR for 5 years | Max Planck Society**
W2 salary for the head of the research group, coverage of one postdoc and one PhD position, competitive research expenditure coverage and initial equipment (spent on HPC cluster "Bordeaux")
- 2022, 2023 **Workshop "Correlations in Novel Quantum Materials" | Budget: 42k USD | ICAM**
- 2019 – 2020 **Erwin-Schrödinger Fellowship | Budget: 160k EUR | Austrian Science Fund (FWF)**
Principal Investigator of the FWF project J-4266
"SuMo - Superconductivity in the vicinity of Mott insulators"
- 2017 **Excellence Scholarship of the Austrian Federal Ministry of Education, Science and Research | Budget: 9k EUR | Austrian Federal Ministry of Education, Science and Research**
Principal Investigator of "Quantum criticality in the two-dimensional periodic Anderson model"

HONORS AND AWARDS

- 2020 "Emerging Leader" 2020 by the Journal of Physics, Condensed Matter
- 2019 Erwin-Schrödinger Fellow funded by the Austrian Science Fund FWF
- 2018 Awardee of the Scholarship of Excellence of the Federal Ministry of Education
- 2018 Finalist of the Dissertation-Prize Symposium of the Condensed Matter Division of the DPG
- 2016 Admission to "Promotio sub auspiciis Praesidentis rei publicae"
- 2015 Young Scientist Attendee of the 65th Interdisciplinary Lindau Nobel Laureate Meeting
- 2013 Award for an outstanding and excellent diploma thesis of the City of Vienna
- 2011 Attendee of the official CERN summer student programme
- 2010/2012 Awardee of the Stiftungsstipendium of the TU Wien
- 2008/2009 Awardee of the student scholarships of the Faculty for Physics of the TU Wien

CURRICULUM VITAE

OTHER SCIENTIFIC ACTIVITIES AND MEMBERSHIPS

- External Reviewer for the National Science Center, Poland and Agence nationale de la recherche (ANR), France
- Referee for Nature, Nature Communications, Physical Review Letters, Physical Review B, Europhysics Letters, Physica Status Solidi and SN Applied Sciences
- Regular mid-term stays at the Center for Computational Quantum Physics, Flatiron Institute, New York, USA: February 2020, February 2019, October 2018, February 2018
- Member of the PhD Commission of the MPI-FKF
- Principal Investigator Max-Planck Graduate Center for Quantum Materials, <https://www.quantummaterials.mpg.de>
- Principal Investigator of the International Max-Planck Research School for Condensed Matter Science, <https://www.imprs-cms.mpg.de>

- Organizer of the International Monthly Symposium on DMFT/Quantum Embedding (online)
- Organizer of the International Workshop "Correlations in Novel Quantum Materials" at the MPI-FKF together with Elio König (online 2021, in person 2022 and 2023), <https://www.fkf.mpg.de/cnqm2023>
- Organizer of the joint "Seminar on Condensed Matter Physics", MPI-FKF and EKUT Tübingen (2020-2021)
- Organizer of the "Condensed Matter Theory Seminar", Collège de France (2019-2020)
- Organizer of the "Condensed Matter Theory Journal Club", Institute of Solid State Physics (2016)
- Student organizer of the "International Conference on the Applications of the Mössbauer Effect" (ICAME2009), TU Wien

- Member of the American Physical Society (APS)
- Member of the German Physical Society (DPG)
- Member of the Deutsche Hochschulverband

LANGUAGE SKILLS

- German: mother tongue
- English: C1 Level in Listening, Reading, Writing
- French: A2 Level in Listening, Reading, Writing

OTHER SKILLS

- Germany's Wine Champion 2023 [German Wine Institute (DWI) and Der FEINSCHMECKER magazine]
- WSET Level 3 Award in Wines, pass with distinction
- Assistant Sommelier (WSET Level 2)
- Scuba Diving License (PADI)
- Competitive Ballroom Dancing
- Delegate to the European Youth Parliament, Berlin November 2004

CURRICULUM VITAE

PUBLICATION RECORD (as of 5th April 2024)

- **30 peer-reviewed Publications:** 1 Nature Communications, 1 Proceedings of the National Academy of Sciences, 2 Physical Review X, 6 Physical Review Letters, 1 Annual Review, 2 Physical Review Research, 1 SciPost Physics, 11 Physical Review B, 5 other journals
- **Citations Metrics:** 1,809 citations, h-index 21 (Google Scholar) – 1,122 citations, h-index 18 (Web of Science) – 1,166 citations, h-index 18 (Scopus)
- Google Scholar: <https://scholar.google.com/citations?user=aJBvSKAAAAAJ&hl=en>
ORCID: [0000-0002-1105-5619](https://orcid.org/0000-0002-1105-5619), ResearcherID: B-9424-2017

Peer-reviewed Journal Publications (top 5 Publications after PhD are marked by an asterix *)

Mott transition and pseudogap of the square-lattice Hubbard model: results from center-focused cellular dynamical mean-field theory

Michael Meixner, Henri Menke, Marcel Klett, Sarah Heinzelmann, Sabine Andergassen, Philipp Hansmann, and Thomas Schäfer

SciPost Physics **16**, 059 (2024), <https://doi.org/10.21468/SciPostPhys.16.2.059>

*** Magnetism and Metallicity in Moiré Transition Metal Dichalcogenides**

Patrick Tscheppe, Jiawei Zang, Marcel Klett, Seher Karakuzu, Armelle Celarier, Zhengqian Cheng, Thomas A. Maier, Michel Ferrero, Andrew J. Millis, and Thomas Schäfer

Proceedings of the National Academy of Sciences **121**, 3 (2024), <https://doi.org/10.1073/pnas.2311486121>

Mott insulators with boundary zeros

Niklas Wagner, Lorenzo Crippa, Adriano Amaricci, Philipp Hansmann, Marcel Klett, Elio König, Thomas Schäfer, Domenico Di Sante, Jennifer Cano, Andrew Millis, Antoine Georges, Giorgio Sangiovanni

Nature Communications **14**, 7531 (2023), <https://doi.org/10.1038/s41467-023-42773-7>

Strongly correlated superconductivity with long-range spatial fluctuations

Motoharu Kitatani, Ryotaro Arita, Thomas Schäfer, Karsten Held

J. Phys. Mater. **5**, 034005 (2022), <https://doi.org/10.1088/2515-7639/ac7e6d>

*** Magnetic correlations in infinite-layer nickelates: an experimental and theoretical multi-method study**

R. A. Ortiz, P. Puphal, M. Klett, F. Hotz, R. K. Kremer, H. Trepka, M. Hemmida, H.-A. Krug von Nidda, M. Isobe, R. Khasanov, H. Luetkens, P. Hansmann, B. Keimer, T. Schäfer, M. Hepting

Physical Review Research **4**, 023093 (2022), <https://doi.org/10.1103/PhysRevResearch.4.023093>

Magnetic properties and pseudogap formation in infinite-layer nickelates: insights from the single-band Hubbard model

Marcel Klett, Philipp Hansmann, and Thomas Schäfer

Frontiers in Physics **10**, 834682 (2022), <https://doi.org/10.3389/fphy.2022.834682>

*** The Hubbard model: A computational perspective**

Mingpu Qin, Thomas Schäfer, Sabine Andergassen, Philippe Corboz, Emanuel Gull

Annual Review of Condensed Matter Physics Vol. **13**, 275-302 (2022), <https://doi.org/10.1146/annurev-conmatphys-090921-033948>

Comparing the effective enhancement of local and non-local spin-orbit couplings on honeycomb lattices due to strong electronic correlations

Markus Richter, Johannes Graspeuntner, Thomas Schäfer, Nils Wentzell, Markus Aichhorn

Phys. Rev. B **104**, 195107 (2021), <https://doi.org/10.1103/PhysRevB.104.195107>

Mott insulating states with competing orders in the triangular lattice Hubbard model

Alexander Wietek, Riccardo Rossi, Fedor Šimkovic IV, Marcel Klett, Philipp Hansmann, Michel Ferrero, E. Miles Stoudenmire, Thomas Schäfer, and Antoine Georges

Phys. Rev. X **11**, 041013 (2021), <https://doi.org/10.1103/PhysRevX.11.041013>

PUBLICATION RECORD (continued)

*** Tracking the Footprints of Spin Fluctuations: A Multi-Method, Multi-Messenger Study of the Two-Dimensional Hubbard Model**

Thomas Schäfer, Nils Wentzell, Fedor Šimkovic IV, Yuan-Yao He, Cornelia Hille, Marcel Klett, Christian J. Eckhardt, Behnam Arzhang, Viktor Harkov, François-Marie Le Régent, Alfred Kirsch, Yan Wang, Aaram J. Kim, Evgeny Kozik, Evgeny A. Stepanov, Anna Kauch, Sabine Andergassen, Philipp Hansmann, Daniel Rohe, Yuri M. Vilks, James P. F. LeBlanc, Shiwei Zhang, A.-M. S. Tremblay, Michel Ferrero, Olivier Parcollet, and Antoine Georges
Phys. Rev. X **11**, 011058 (2021), <https://dx.doi.org/10.1103/PhysRevX.11.011058>

How to read between the lines of electronic spectra: the diagnostics of fluctuations in strongly correlated electron systems

Thomas Schäfer and Alessandro Toschi

J. Phys.: Condens. Matter **33**, 214001 (2021), Special Issue: Emerging Leaders 2020, <https://dx.doi.org/10.1088/1361-648X/abeb44>

Fingerprints of the local moment formation and its Kondo screening in generalized susceptibilities of many-electron problems

P. Chalupa, T. Schäfer, M. Reitner, D. Springer, S. Andergassen, and A. Toschi

Phys. Rev. Lett. **126**, 056403 (2021), <https://dx.doi.org/10.1103/PhysRevLett.126.056403>

Anisotropy of electronic correlations: On the applicability of local theories to layered materials

B. Klebel, T. Schäfer, A. Toschi, and J. M. Tomczak

Phys. Rev. B **103**, 045121 (2021), <https://doi.org/10.1103/PhysRevB.103.045121>

Real-space cluster dynamical mean-field theory: Center focused extrapolation

M. Klett, N. Wentzell, T. Schäfer, F. Šimkovic IV, O. Parcollet, S. Andergassen, and P. Hansmann

Phys. Rev. Research **2**, 033476 (2020), <https://doi.org/10.1103/PhysRevResearch.2.033476>

*** Quantum Criticality in the Two-Dimensional Periodic Anderson Model**

T. Schäfer, A. A. Katanin, M. Kitatani, A. Toschi, K. Held

Phys. Rev. Lett. **122**, 227201 (2019), <https://doi.org/10.1103/PhysRevLett.122.227201>

Why T_c is so low in high- T_c cuprates: importance of the dynamical vertex structure

M. Kitatani, T. Schäfer, H. Aoki, K. Held

Phys. Rev. B **99**, 041115(R) (2019), <https://doi.org/10.1103/PhysRevB.99.041115>

Divergences of the irreducible vertex functions in correlated metallic systems: insight from AIM

P. Chalupa, P. Gunacker, T. Schäfer, K. Held, and A. Toschi

Phys. Rev. B **97**, 245136 (2018), <https://doi.org/10.1103/PhysRevB.97.245136>

Complementary views on electron spectra: From Fluctuation Diagnostics to real space correlations

O. Gunnarsson, J. Merino, T. Schäfer, G. Sangiovanni, G. Rohringer, and A. Toschi

Phys. Rev. B **97**, 125134 (2018), <https://doi.org/10.1103/PhysRevB.97.125134>

Breakdown of traditional many-body theories for correlated electrons

O. Gunnarsson, G. Rohringer, T. Schäfer, G. Sangiovanni, and A. Toschi

Phys. Rev. Lett. **119**, 056402 (2017), <https://doi.org/10.1103/PhysRevLett.119.056402>

Interplay of correlations and Kohn anomalies in three dimensions: quantum criticality with a twist

T. Schäfer, A. A. Katanin, K. Held, and A. Toschi

Phys. Rev. Lett. **119**, 046402 (2017), <https://doi.org/10.1103/PhysRevLett.119.046402>

Non-perturbative landscape of the Mott-Hubbard transition: Multiple divergence lines around the MIT

T. Schäfer, S. Ciuchi, M. Wallerberger, P. Thunström, O. Gunnarsson, G. Sangiovanni, G. Rohringer, and A. Toschi

Phys. Rev. B **94**, 235108 (2016), <https://doi.org/10.1103/PhysRevB.94.235108>

PhD

CURRICULUM VITAE

PUBLICATION RECORD (continued)

Parquet decomposition calculations of the electronic self-energy

O. Gunnarsson, T. Schäfer, J. P. F. LeBlanc, J. Merino, G. Sangiovanni, G. Rohringer, and A. Toschi
Phys. Rev. B **93**, 245102 (2016) featured as Editor's Suggestion <http://dx.doi.org/10.1103/PhysRevB.93.245102>

Fluctuation Diagnostics of the Electron Self-Energy: Origin of the Pseudogap Physics

O. Gunnarsson, T. Schäfer, J. LeBlanc, E. Gull, J. Merino, G. Sangiovanni, G. Rohringer, and A. Toschi
Phys. Rev. Lett. **114**, 236402 (2015), <http://dx.doi.org/10.1103/PhysRevLett.114.236402>

Separability of dynamical and nonlocal correlations in three dimensions

T. Schäfer, A. Toschi, and Jan M. Tomczak
Phys. Rev. B **91**, 121107(R) (2015), <http://dx.doi.org/10.1103/PhysRevB.91.121107>

Fate of the false Mott-Hubbard transition in two dimensions

T. Schäfer, F. Geles, D. Rost, G. Rohringer, E. Arrigoni, K. Held, N. Blümer, M. Aichhorn, and A. Toschi
Phys. Rev. B. **91**, 125109 (2015), <http://dx.doi.org/10.1103/PhysRevB.91.125109>

Dynamical vertex approximation in its parquet implementation: Application to Hubbard nanorings

A. Valli, T. Schäfer, P. Thunström, G. Rohringer, S. Andergassen, G. Sangiovanni, K. Held, and A. Toschi
Phys. Rev. B **91**, 115115 (2015), <http://dx.doi.org/10.1103/PhysRevB.91.115115>

Divergent Precursors of the Mott-Hubbard Transition at the Two-Particle Level

T. Schäfer, G. Rohringer, O. Gunnarsson, S. Ciuchi, G. Sangiovanni, and A. Toschi
Phys. Rev. Lett. **110**, 246405 (2013), <http://dx.doi.org/10.1103/PhysRevLett.110.246405>

Conference Proceedings and other publications

Das Ganze ist mehr als die Summe seiner Teile – neue Perspektiven auf komplexe Quantensysteme mit vielen Teilchen

Thomas Schäfer

Yearbook of the Max Planck Society 2022

https://www.fkf.mpg.de/8117936/research_report_19492136?c=164385

Fluctuation Diagnostics of Electronic Spectra

O. Gunnarsson, T. Schäfer, J. LeBlanc, E. Gull, J. Merino, G. Sangiovanni, G. Rohringer, and A. Toschi
Proceedings of the Vienna Young Scientists Symposium, 9.-10.06.2016, ISBN 978-3-9504017-2-1

Dynamical vertex approximation for the two-dimensional Hubbard model

T. Schäfer, A. Toschi, and K. Held

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