

Curriculum vitae: Prof. Dr. Richard Schmidt

Personal and Professional Information

Position	Full Professor (W3), Chair for Theoretical Physics
Address	Institute for Theoretical Physics, Heidelberg University, Philosophenweg 16, 69120 Heidelberg, Germany Email: richard.schmidt@thphys.uni-heidelberg.de Web: www.quantummatter.de

Professional Experience and Appointments

since 09/2022	Professor for Theoretical Physics, Heidelberg University, Germany
2021–2022	Associate Professor for Theoretical Physics, Aarhus University, Denmark
2018–2022	Independent Max Planck Research Group Leader (W2; from Nov. 2021 part-time) Max Planck Institute of Quantum Optics, Garching (Germany)
2017	Pauli Center Visiting Fellow and Research Associate ETH Zürich, Zurich (Switzerland)
2016–2017	Research Associate in the Condensed Matter Theory Group Harvard University, Cambridge (USA)
2013–2016	ITAMP Postdoctoral Fellow at the Harvard-Smithsonian Center of Astrophysics Harvard University, Cambridge (USA)

Education

2009–2013	PhD studies in theoretical physics — Grade: “with distinction” (highest grade) Thesis title: “From few- to many-body physics with ultracold atoms” Advisor: Prof. Wilhelm Zwerger Technische Universität München (Germany)
2002–2009	Diploma studies in physics — Grade: 1.0 (highest grade) Thesis title: “Trion Formation in Ultracold Fermi Gases” Advisor: Prof. Christof Wetterich Universität Heidelberg (Germany)
2005–2006	Research stay and Exchange-Student Fellow of the Baden-Württemberg Foundation University of New Mexico, Albuquerque (USA); work in CDF collaboration (Fermilab)

Scientific Profile

Publication overview	Author of 74 publications and 6 preprints (37 first or last author), including: 1 Nature, 1 Science, 2 Nature Physics, 6 Phys. Rev. X, 1 Nature Communications, 15 Phys. Rev. Lett., 1 review each in Reviews of Modern Physics and Rep. Prog. Phys., 1 popular science article, and 1 invited book contribution for the Royal Society of Chemistry. Total citations: > 6300 — h-index: 41 (Google Scholar), Average citations per publication: 78
Talks and Lecture series	More than 140 invited talks, seminars, and colloquia, including invited plenary talks at DAMOP, ICPEAC, DFG Spring Meeting; Invited lecture series at Tsinghua University (China); ITAMP Winterschool (USA); Graduate Days Hamburg (Germany)
Scientific Interests	• Condensed matter theory • 2D Materials • Quantum Optical Systems • Quantum Gases • Semiconductor physics • Quantum Simulation • Polarons • Quantum Dynamics • Few-body and scattering physics • Quantum field theory • Functional renormalization group • Functional Determinants

Scientific Profile (cont.)

Main scientific achievements

- Mass-gap model: Unified theory of mobile Fermi polarons (2025)
- Phase diagram for strong-coupling Bose polarons (2024)
- Prediction of novel trion-based interaction mechanism to induce superconductivity in 2D materials (2024)
- Development of first-principle approach to exciton-electron scattering in atomically thin semiconductors (2020)
- First description of Fermi-polaron induced optical gain in 2D materials (2020)
- Theoretical model of Bose polaron dynamics at finite temperature (2019)
- Development of theory of Rydberg polarons, Rydberg excitations dressed by molecular bound states (2016–17) [observation at Rice University in 2018]
- Development of a new computational Functional Determinant Approach to predict molecular absorption line shapes for large bound complexes (2016)
- First description of rotating molecules in superfluid Helium nanodroplets in terms of quasiparticles (2015); Development of angulon theory (2016)
- First description and prediction of emergence of strong coupling Bose polarons in ultracold atoms; derivation of new many-body Hamiltonian (2013) [experimental observation at JILA, MIT, Aarhus in 2016–2019]
- First theoretical prediction of repulsive polarons in Fermi gases (2011) [experimental observation in ultracold atoms in 2012, and in 2D materials in 2017]
- First complete model of the Efimov effect close to Feshbach resonances; prediction of three-body parameter (2012) [observation at JILA in 2019]
- Development of new computational functional renormalization group tool to predict correlation functions with full frequency and momentum dependence (2011)
- First exact functional RG solution of the quantum three-body problem (2009)

Awards, Honours, and Fellowships

- 2026 Teaching Award for Lecture 'Theoretical Physics I' in the winter term 2025/26 at Heidelberg University (attended by more than 450 students)
- 2018 Independent Max Planck Research Group Leader
Awarded by the Max Planck Society in an international, open-topic call with free choice of institute; yearly typically five positions are awarded across all subject areas of Chemistry, Physics and Technology
- 2017 Visiting Fellow of the Pauli Center for Theoretical Physics, ETH Zürich (Switzerland)
- 2013 Postdoctoral Fellowship of the National Science Foundation (USA)
Institute for Theoretical Atomic, Molecular and Optical Physics (ITAMP)
Yearly one distinguished full-time postdoctoral position is awarded in an international call
- 2005 Fellowship of the Baden-Württemberg Foundation

Support of Early Career Researchers and Supervision

In my research group I have supervised 6 postdocs, 9 PhD students, 12 MSc students, and 11 BSc students (Total: 38).

Teaching Experience

- SS 2026 "Theoretical Physics II: Analytical Mechanics, Thermodynamics, Statistical Physics"
Lecture course at BSc level at Heidelberg University
- WS 2025/26 "Theoretical Physics I: Classical Mechanics"
Lecture course at BSc level at Heidelberg University

- SS 2025 “Condensed Matter Theory II”
Lecture course at MSc level at Heidelberg University
- WS 2024/25 “Condensed Matter Theory I”
Lecture course at MSc level at Heidelberg University
- WS 2023/24 “Theoretical Physics I: Newton Mechanics and Mathematical Methods”
Lecture course at BSc level at Heidelberg University
- SS 2023 “Polarons: from cold atoms to atomically thin materials”
Lecture course at MSc level at Heidelberg University
- 2019 Hamburg University, Germany
CUI Graduate Days 2019
Lecture series: Polaron physics in ultracold atoms and solid-state materials
- 2019 Biosphere 2, Arizona, USA
2019 ITAMP Winter School “Dynamics of Quantum Many-body Systems”
Lecture series: Polaron physics in ultracold atoms and novel semiconductors
- 2017 ETH Zurich, Switzerland:
Two guest lectures within master level course 402-0484-00L “Experimental and Theoretical Aspects of Quantum Gases”:
Few-body physics with ultracold atoms and quantum impurity problems
- 2017 Harvard University, Cambridge, USA
Two-part guest lecture within graduate course Physics 268R “Special Topics in Condensed Matter Physics. Quantum Many-Body Systems”:
Functional renormalization group approach to Efimov physics
- 2016 Harvard University, Cambridge, USA
Several classes held on semiconductor physics within the undergraduate course Physics 195: “Introduction to Solid State Physics”
- 2014 Harvard University, Cambridge, USA
Three-part guest lecture within Physics 284 “Strongly Correlated Systems in Atomic and Condensed Matter Physics”:
Efimov physics in ultracold quantum gases
- 2014 Tsinghua University, Institute for Advanced Studies, Beijing, China
Invited lecture series: Few-body physics from the functional renormalization group
- 2009–2012 Technical University Munich, Munich, Germany
Teaching and Lecture assistant in: Classical mechanics, Theoretical solid state physics, Quantum mechanics, Statistical mechanics, Scattering theory

Research management, service to profession, memberships

Committee Work

- since 2025 Member of the Examination Board of the Faculty for Physics and Astronomy, Heidelberg University
- 2024–2026 Coordinator of Research Area
“CP4 – Quantum Dynamics and Structure” of the Heidelberg Excellence Cluster STRUCTURES
- 2019–2022 Member of Executive Committee
Munich Excellence Cluster “Munich Center of Quantum Science and Technology”
- 2019–2022 Diversity Representative of the International Max Planck Research School of Quantum Science and Technology (IMPRS QST)
- 2018–2021 Member of Steering Committee of the IMPRS QST
- 2014–2016 Member of the Harvard Physics Research Scholar Committee

Organization of Conferences, Workshops, Colloquia, and related events

- 2019–2021 Organizer of Munich Excellence Cluster MCQST colloquium series (confirmed speakers include: John Preskill, Erez Berg, Claudia Felser, Mikhail Lukin, Atac Imamoglu, Lieven Vandersypen, Kang-Kuen Ni, Markus Aspelmeyer)

- 2019 Organiser of the ASC-CENS workshop “Many-body physics with cold atoms and beyond” held in Munich, Germany; 90 participants (speakers included: Anthony Leggett, Matthew Fisher, Gianni Blatter, Eugene Demler, Markus Greiner, Martin Zwierlein), September 5–6, 2019
- 2017 Co-Organiser of the “ITAMP-IST Workshop on Quantum Impurities in Atomic, Condensed-Matter and Chemical Systems” jointly funded by the IST Austria and ITAMP, Cambridge, USA; held in Klosterneuburg, Austria, August 16–18, 2017
- 2016 Organizer of Harvard Physics Department Postdoc Training Panel Discussion “Jobs in Academia: application, interviews, and negotiations”
- 2015–2016 Organizer of 3rd and 4th Annual Harvard Physics Department Research Scholar Retreat
- 2014–2015 Organizer of ITAMP Topical Discussions Seminar

Outreach

- 2026 Career Advise and Insights “Meet & Mingle ISOQUANT” — Presentation and Discussion with the FLINTA community, Heidelberg University
 - 2026 Schülertag 2026: Lecture “Von Weltmodellen zum freien Fall”, Heidelberg University.
 - 2023 Public outreach lecture “Quasiteilchen”, Akademische Mittagspause 2023, Peter-skirche Heidelberg.
 - 2019 Public outreach lecture for visiting delegation of the Canadian Consulate: “Exploring universal quantum matter in cold atoms and atomically thin semiconductors”
 - 2016 Co-Organizer of Science Day for young high school students: John Hopkins Center for Talented Youth, Family Academic Programs Science and Technology Series at ITAMP, Cambridge (USA)
- Reviewer** European Commission (ERC), Israel Science Foundation, Swiss Science Foundation, German Science Foundation, Poland Nat. Science Center, Dutch Research Council
- Referee** Nature, Physical Review X, Physical Review Letters, Physical Review A, Science Advances, New Journal of Physics, Journal of Chemical Physics, European Physical Journal B, Journal of Physics A, Nanomaterials, Physics Letters A, European Phys. Jour. Plus, npj Quantum Materials, Canadian Journal of Physics, SciPost
- Memberships**
- German Physical Society
 - American Physical Society

Publications

Reviews

- 80. P. Massignan, R. Schmidt, G. E. Astrakharchik, A. Imamoglu, M. Zwierlein, J. J. Arlt, G. M. Bruun
Polarons in atomic gases and two-dimensional semiconductors, Rev. Mod. Phys., in press, (2026).
- 79. R. Schmidt, M. Knap, D. A. Ivanov, J.-S. You, M. Cetina and E. Demler
Universal many-body response of heavy impurities coupled to a Fermi sea: a review of recent progress, Rep. Prog. Phys. 81, 024401 (2018).
- 78. S. Floerchinger, S. Moroz, and R. Schmidt
Efimov Physics from the Functional Renormalization Group, Few-body Syst. 51, 153 (2011).

Peer-Reviewed Book contributions

- 77. M. Leshchko, and R. Schmidt
Molecular impurities interacting with a many-particle environment: from ultracold gases to helium nanodroplets, Chapter in “Cold Chemistry: Molecular Scattering and Reactivity Near Absolute Zero”, edited by A. Osterwalder and O. Dulieu. Royal Society of Chemistry (2017).

Preprints

76. F. Hirsch, O. K. Diessel, R. Ołdziejewski, R. Schmidt
Quantum Simulation of Semiconductor Excitons in Ultracold Dipolar Fermi Gases,
arXiv:2607.19467 (2026).
75. X. Chen, E. Dizer, R. Ołdziejewski, K. S. Novoselov, M. Kanasz-Nagy, R. Schmidt
Emergent Fermi polarons in Dirac materials,
arXiv:2607.04161 (2026).
74. C. Robens, A. Christianen, A. Y. Chuang, H. Q. Bui, Y. Zhang, R. Schmidt, M. Zwierlein
Polaronic hybridization of atoms, dimers and trimers in a Bose-Einstein condensate,
arXiv:2606.20440 (2026).
73. J. Bohm, R. Schmidt, M. Fleischhauer, D. Brady
Quantum Contact Processes on a Topological Lattice,
arXiv:2604.03184 (2026).
72. E. Vlasiuk, M. Salmhofer, E. Demler, R. Schmidt
Enhancing superconductivity using thermal bosons,
arXiv:2603.06796 (2026).
71. I. N. Cherepanov, G. Bighin, L. Christiansen, A. V. Jørgensen, R. Schmidt,
H. Stapelfeldt, M. Lemesko
*Far-from-equilibrium dynamics of angular momentum in a quantum many-particle
system*,
arXiv:1906.12238 (2019).

Peer-Reviewed Articles

70. H. S. Adlong, E. Dizer, R. Schmidt, A. Imamoglu, A. Christianen
Microscopic Model of Exciton Polarons in 2D Wigner Crystals,
Phys. Rev. Lett. 137, 076503 (2026).
69. L. Zhang, L. Gu, H. S. Adlong, A. Christianen, E. Dizer, R. Ni, R. Ma, S. Park, H. Jang,
T. Taniguchi, K. Watanabe, I. Esterlis, R. Schmidt, A. Imamoglu, Y. Zhou
*Wigner polarons probe the dynamics of a Wigner crystal in a monolayer semicon-
ductor*,
Nature Physics, in press (2026).
68. E. Ramos Rodríguez, M. Gievers, R. Schmidt
*Probing Bardeen-Cooper-Schrieffer Pairing and Quasiparticle Formation in Ultracold
Gases by Rydberg Atom Spectroscopy*,
Phys. Rev. Lett. 136, 243401 (2026).
67. X. Chen, E. Dizer, E. Ramos Rodríguez, R. Schmidt
Mass-gap description of heavy impurities in Fermi gases,
Phys. Rev. Lett. 135, 193401 (2025).
66. M. Wagner, R. Ołdziejewski, F. Rose, V. Köder, C. Kuhlenkamp, A. Imamoglu,
R. Schmidt
Feshbach Resonances in Exciton-Charge-Carrier Scattering in Semiconductor Bilayers,
Phys. Rev. Lett. 134, 076903 (2025).
65. M. Gievers, R. Schmidt, J. von Delft, F. B. Kugler
Subleading logarithmic behavior in the parquet formalism,
Phys. Rev. B 111, 085151 (2025).
64. J. von Milczewski, R. Schmidt
*Momentum-dependent quasiparticle properties of the Fermi polaron from the func-
tional renormalization group*,
Phys. Rev. A 110, 033309 (2024).
63. J. von Milczewski, X. Chen, A. Imamoglu, R. Schmidt
*Superconductivity induced by strong electron-exciton coupling in doped atomically
thin semiconductor heterostructures*,
Phys. Rev. Lett. 133, 226903 (2024).

62. T. Dome, A. G. Volosniev, A. Ghazaryan, L. Safari, R. Schmidt, M. Lemeshko
Linear rotor in an ideal Bose gas near the threshold for binding,
Phys. Rev. B 109, 014102 (2024).
61. A. Christianen, J. I. Cirac, R. Schmidt
Phase diagram for strong-coupling Bose polarons,
SciPost Phys. 16, 067 (2024).
60. M. Gievers, M. Wagner, R. Schmidt
Probing polaron clouds by Rydberg atom spectroscopy,
Phys. Rev. Lett. 132, 053401 (2024).
59. O. K. Diessel, J. von Milczewski, A. Christianen, R. Schmidt
Probing molecular spectral functions and unconventional pairing using Raman spectroscopy,
Phys. Rev. Research 6, 023239 (2024).
58. L. B. Tan, O. K. Diessel, A. Popert, R. Schmidt, A. Imamoglu, M. Kroner
Bose polaron interactions in a cavity-coupled monolayer semiconductor,
Phys. Rev. X 13, 031036 (2023).
57. R. Li, J. von Milczewski, A. Imamoglu, R. Ołdziejewski, R. Schmidt
Impurity-induced pairing in two-dimensional Fermi gases,
Phys. Rev. B 107, 155135 (2023).
56. Z. Zeng, E. Yakaboylu, M. Lemeshko, T. Shi, R. Schmidt
Variational theory of angulons and their rotational spectroscopy,
J. Chem. Phys. 158, 134301 (2023).
55. I. Amelio, N. D. Drummond, E. Demler, R. Schmidt, A. Imamoglu
Polaron spectroscopy of a bilayer excitonic insulator,
Phys. Rev. B 107, 155303 (2023).
54. M. Duda, X. Y. Chen, A. Schindewolf, R. Bause, J. von Milczewski, R. Schmidt, I. Bloch, X. Y. Luo
Transition from a polaronic condensate to a degenerate Fermi gas of heteronuclear molecules,
Nature Physics 19, 720 (2023).
53. A. Christianen, J. I. Cirac, R. Schmidt
Chemistry of a light impurity in a Bose-Einstein condensate,
Phys. Rev. Lett. 128, 183401 (2022).
52. A. Christianen, J. I. Cirac, R. Schmidt
Bose polaron and the Efimov effect: A Gaussian-state approach,
Phys. Rev. A 105, 053302 (2022).
[\[Editor's suggestion\]](#)
51. J. von Milczewski, F. Rose, R. Schmidt
Functional renormalization group approach to strongly-coupled Bose-Fermi mixtures in two dimensions,
Phys. Rev. A 105, 013317 (2022).
50. F. Rose, R. Schmidt
Disorder in order: Localization without randomness in a cold-atom system,
Phys. Rev. A 105, 013324 (2022).
49. S. Tiwari, F. Engel, M. Wagner, R. Schmidt, F. Meinert, S. Wüster
Dynamics of atoms within atoms,
New J. Phys. 24, 073005 (2022).
48. R. Ołdziejewski, A. Chiocchetta, J. Knörzer, R. Schmidt
Excitonic Tonks-Girardeau and charge-density wave phases in monolayer semiconductors,
Phys. Rev. B 106, L081412 (2022).
47. C. Kuhlenskamp, M. Knap, M. Wagner, R. Schmidt, A. Imamoglu
Tunable Feshbach resonances and their spectral signatures in bilayer semiconductors,
Phys. Rev. Lett. 129, 037401 (2022).

46. R. Schmidt, T. Enss
Self-stabilized Bose polarons,
SciPost Phys. 13, 054 (2022).
45. Y. Shimazaki, C. Kuhlenskamp, I. Schwartz, T. Smolenski, K. Watanabe, T. Taniguchi, M. Kroner, R. Schmidt, M. Knap, A. Imamoglu
Optical Signatures of Periodic Charge Distribution in a Mott-like Correlated Insulator State,
Phys. Rev. X 11, 021027 (2021).
44. A. Imamoglu, O. Cotlet, R. Schmidt
Exciton-polarons in two-dimensional semiconductors and the Tavis-Cummings model,
Comptes Rendus. Physique 22, 1 (2021).
43. G. E. Astrakharchik, L. A. Peña Ardila, R. Schmidt, K. Jachymski, A. Negretti
Ionic polaron in a Bose-Einstein condensate,
Communications Physics 4, 94 (2021).
42. N. E. Guenther, R. Schmidt, G. M. Bruun, V. Gurarie, P. Massignan
Mobile impurity in a Bose-Einstein condensate and the orthogonality catastrophe,
Phys. Rev. A 103, 013317 (2021).
41. T. Wasak, R. Schmidt, F. Piazza
Quantum-Zeno Fermi polaron in the strong dissipation limit,
Phys. Rev. Research 3, 013086 (2021).
40. G. Ness, C. Shkedrov, Y. Florschaim, O. K. Diessel, J. von Milczewski, R. Schmidt, Y. Sagi
Observation of a smooth polaron-molecule transition in a degenerate Fermi gas,
Phys. Rev. X 10, 041019 (2020).
39. P. P. Mazza, R. Schmidt, I. Lesanovsky
Vibrational dressing in kinetically constrained spin systems,
Phys. Rev. Lett. 125, 033602 (2020).
38. L. B. Tan, O. Cotlet, A. Bergschneider, R. Schmidt, P. Back, Y. Shimazaki, M. Kroner, A. Imamoglu
Interacting Polaron-Polaritons,
Phys. Rev. X 10, 021011 (2020).
37. C. Fey, P. Schmelcher, A. Imamoglu, R. Schmidt
Theory of exciton-electron scattering in atomically thin semiconductors,
Phys. Rev. B 101, 195417 (2020).
[\[Editor's suggestion\]](#)
36. D. Dzsoťjan, R. Schmidt, M. Fleischhauer
Dynamical variational approach to Bose polarons at finite temperatures,
Phys. Rev. Lett. 124, 223401 (2020).
35. J. Sous, H. R. Sadeghpour, T. C. Killian, E. Demler, R. Schmidt
Rydberg impurity in a Fermi gas: Quantum statistics and rotational blockade,
Phys. Rev. Research 2, 023021 (2020).
34. X. Li, E. Yakaboylu, G. Bighin, R. Schmidt, M. Lemesko, A. Deuchert
Intermolecular forces and correlations mediated by a phonon bath,
J. Chem. Phys. 152, 164302 (2020).
33. J. Knörzer, M. J. A. Schuetz, G. Giedke, D. S. Wild, K. De Greve, R. Schmidt, M. D. Lukin, J. I. Cirac
Wigner Crystals in Two-Dimensional Transition-Metal Dichalcogenides: Spin Physics and Readout,
Phys. Rev. B 101, 125101 (2020).
[\[Editor's suggestion\]](#)
32. Y. Ashida, T. Shi, R. Schmidt, H. R. Sadeghpour, J. I. Cirac, E. Demler
Quantum Rydberg Central Spin Model,
Phys. Rev. Lett. 123, 183001 (2019).
[\[Editor's suggestion\]](#)

31. J. Klein, M. Lorke, M. Florian, F. Sigger, J. Wierzbowski, J. Cerne, K. Müller, T. Taniguchi, K. Watanabe, U. Wurstbauer, M. Kaniber, M. Knap, R. Schmidt, J. J. Finley, A. W. Holleitner
Site-selectively generated photon emitters in monolayer MoS₂ via local helium ion irradiation,
Nature Communications 10, 2755 (2019).
30. J. D. Whalen, S. K. Kanungo, R. Ding, M. Wagner, R. Schmidt, H. R. Sadeghpour, S. Yoshida, J. Burgdörfer, F. B. Dunning, and T. C. Killian
Probing nonlocal spatial correlations in quantum gases with ultra-long-range Rydberg molecules,
Phys. Rev. A 100, 011402(R) (2019).
29. Y. Ashida, T. Shi, R. Schmidt, H. R. Sadeghpour, J. I. Cirac, E. Demler
Efficient variational approach to dynamics of a spatially extended bosonic Kondo model,
Phys. Rev. A 100, 043618 (2019).
[\[Editor's suggestion\]](#)
28. J.-S. You, R. Schmidt, D. A. Ivanov, M. Knap, E. Demler
Atomtronics with a spin: statistics of spin transport and non-equilibrium orthogonality catastrophe in cold quantum gases,
Phys. Rev. B 99, 214505 (2019).
27. O. Cotlet, F. Pientka, R. Schmidt, G. Zarand, E. Demler, A. Imamoglu
Transport of neutral optical excitations using electric fields,
Phys. Rev. X 9, 041019 (2019).
26. R. Schmidt, F. Camargo, J. D. Whalen, R. Ding, G. Woehl Junior, S. Yoshida, J. Burgdörfer, F. B. Dunning, E. Demler, H. R. Sadeghpour, and T.C. Killian
Theory of excitation of Rydberg polarons in an atomic quantum gas,
Phys. Rev. A 97, 022707 (2018).
[Wikipedia article: Rydberg polarons](#)
25. Y. Ashida, R. Schmidt, L. Tarruell, and E. Demler
Many-body interferometry of magnetic polaron dynamics,
Phys. Rev. B 97, 060302 (Rapid Communication) (2018).
[Research highlight in Nature Physics](#)
24. F. Camargo, R. Schmidt, J. D. Whalen, R. Ding, G. Woehl Junior, S. Yoshida, J. Burgdörfer, F. B. Dunning, H. R. Sadeghpour, E. Demler, and T.C. Killian
Creation of Rydberg Polarons in a Bose Gas,
Phys. Rev. Lett. 120, 083401 (2018).
[Extensive press coverage; Altmetric top 1% \(Jan. 2019\)](#)
23. C. Langmack, R. Schmidt, and W. Zwerger
Efimov states near a Feshbach resonance and the limits of van der Waals universality at finite background scattering length,
Phys. Rev. A 97, 033623 (2018).
22. A. Mazurenko, C. S. Chiu, G. J. Ji, M. F. Parsons, M. Kanasz-Nagy, R. Schmidt, F. Grusdt, E. Demler, D. Greif, and M. Greiner
A cold-atom Fermi–Hubbard antiferromagnet,
Nature 545, 462 (2017).
[News & Views in Nature \(T. Giamarchi\)](#)
21. K. Agarwal, R. Schmidt, B. Halperin, V. Oganesyan, G. Zarand, M. D. Lukin, E. Demler
Magnetic noise spectroscopy as a probe of local electronic correlations in two-dimensional systems,
Phys. Rev. B 95, 155107 (2017).
20. J. M. Pawłowski, M. M. Scherer, R. Schmidt, and S. J. Wetzel
Functional Renormalization Group Flows and the Physics of Regulator Choice,
Ann. Phys. 384, 165 (2017).

19. F. Grusdt, R. Schmidt, Y. Shchadilova, and E. Demler
Strong coupling Bose polarons in a BEC,
Phys. Rev. A 96, 013607 (2017).
18. M. Cetina, M. Jag, R. S. Lous, I. Fritsche, J. T. M. Walraven, R. Grimm, J. Levinsen, M. M. Parish, R. Schmidt, M. Knap, and E. Demler
Ultrafast many-body interferometry of impurities coupled to a Fermi sea,
Science 354, 96 (2016).
17. Y. Shchadilova, R. Schmidt, F. Grusdt, and E. Demler
Quantum dynamics of ultracold Bose polarons,
Phys. Rev. Lett. 117, 113002 (2016).
16. R. Schmidt, H. Sadeghpour, and E. Demler
A mesoscopic Rydberg impurity in an atomic quantum gas,
Phys. Rev. Lett. 116, 105302 (2016).
15. S. Markson, S. T. Rittenhouse, R. Schmidt, J. P. Shaffer, and H. R. Sadeghpour
Theory of ultralong-range Rydberg molecule formation incorporating spin-dependent relativistic effects: Cs(6s)–Cs(np) as case study,
ChemPhysChem 17, 3683 (2016).
14. R. Schmidt, and M. Leshko
Deformation of a quantum many-particle system by a rotating impurity,
Phys. Rev. X 6, 011012 (2016).
[Viewpoint in Physics: "A new angle on Quantum Impurities"](#)
13. B. Midya, M. Tomza, R. Schmidt, and M. Leshko
Rotation of cold molecular ions inside a Bose-Einstein condensate,
Phys. Rev. A 94, 041601 (Rapid Communication) (2016).
12. R. Schmidt, and M. Leshko
Rotation of Quantum Impurities in the Presence of a Many-Body Environment,
Phys. Rev. Lett. 114, 203001 (2015).
[\[Editor's suggestion\]](#) • [Article on Wikipedia: Quasiparticles](#)
11. S. P. Rath, and R. Schmidt
Field-theoretical study of the Bose polaron,
Phys. Rev. A 88, 053632 (2013).
10. R. Schmidt, S. P. Rath, and W. Zwerger
Efimov physics beyond universality,
Eur. Phys. J. B 85, 386 (2012).
9. R. Schmidt, T. Enss, V. Pietilä, and E. Demler
Fermi polarons in two dimensions,
Phys. Rev. A 85, 021602 (Rapid Communication) (2012).
8. R. Schmidt, and T. Enss
Excitation spectra and rf response near the polaron-to-molecule transition from the functional renormalization group,
Phys. Rev. A 83, 063620 (2011).
7. R. Schmidt, and S. Moroz
Renormalization-group study of the four-body problem,
Phys. Rev. A 81, 052709 (2010).
6. S. Moroz, and R. Schmidt
Nonrelativistic inverse square potential, scale anomaly, and complex extension,
Ann. Phys. 325, 491 (2010).
5. R. Schmidt, and S. Moroz
Functional renormalization-group approach to the four-body problem,
EPJ Web of Conf. 3, 19th International IUPAP Conference on Few-Body Problems in Physics (2010).
4. S. Floerchinger, R. Schmidt, and C. Wetterich
Three-body loss in lithium from functional renormalization,
Phys. Rev. A 79, 053633 (2009).

3. S. Moroz, S. Floerchinger, R. Schmidt, and C. Wetterich
Efimov effect from functional renormalization,
Phys. Rev. A 79, 042705 (2009).
2. S. Floerchinger, R. Schmidt, S. Moroz, and C. Wetterich
Functional renormalization for trion formation in ultracold fermion gases,
Phys. Rev. A 79, 013603 (2009).

Popular Science Articles

1. R. Schmidt, and M. Knap
Quasiteilchen in Zeitlupe,
Physik in unserer Zeit 48, 6 (2017).

Talks, Colloquia, Seminars

145. *Quantum Simulation of semiconductor physics with cold atoms*,
Talk at the 859th WE-Heraeus-Seminar: "New Trends in Degenerate Gases: Quantum Computation and Simulation", Bad Honnef, Germany (June 24, 2026).
144. *Discussion about some thoughts on (Fermi) polarons*,
Talk at the Polaron Network Founding Meeting, Apolda, Germany (March 3, 2026).
143. *Novel theoretical approaches to the Fermi polaron problem*,
Invited talk at the International ICTP Workshop on Impurity Problems in Quantum Mixtures, Trieste, Italy (February 23, 2026).
142. *Exciton-induced superconductivity in atomically thin semiconductor heterostructures*,
Invited talk at the 17th International Conference on Nonlinear Optics and Excitation Kinetics in Semiconductors (NOEKS 17), Marburg, Germany (September 8, 2025).
141. *Cold-atom based quantum simulation of excitons in two-dimensional materials*,
Invited talk at the CQS Seminar, Tübingen University, Germany (May 13, 2025).
140. *Some theorists' thoughts on exciton-induced electron-pairing*,
Talk at the "2D Materials Network Meeting", ETH Zurich, Switzerland (October 21, 2024).
139. *Perspectives for quantum simulation of 2D Materials with ultracold atoms and molecules*,
Invited talk at the International Workshop "Quantum Simulation with Ultracold Atoms", Florence, Italy (October 2, 2024).
138. *Exciton-induced superconductivity in atomically thin semiconductors*,
Invited talk at the International Conference on Physics of Excitons and Polaritons in Semiconductors (PEPS 2024), Reykjavík, Iceland (August 9, 2024).
137. *Connecting the physics of cold atoms and 2D materials: From polarons to superconductivity*,
Invited talk at the ITAMP Workshop "35 Years of Science at ITAMP", Harvard University, USA (May 17, 2024).
136. *Connecting the physics of cold atoms and 2D materials: From polarons to superconductivity*,
Invited talk at the ISOQUANT Lunch Seminar, Heidelberg University, Germany (May 13, 2024).
135. *Polaron formation in Rydberg systems and Rydberg excitations as a probe of correlated quantum matter*,
Talk at the SPP 1929 GiRyd Final Colloquium 2023, Bad Honnef, Germany (November 1, 2023).
134. *Strong-coupling Bose polarons: From Chemistry to Phase diagrams*,
Invited talk at the International Workshop "Ultracold Mixtures: Polarons and Beyond", Oxford University, UK (September 18, 2023).

133. *From Bose-Fermi mixtures to an emerging BEC-BCS crossover in atomically thin semi-conductors*,
Invited talk at the International Workshop “Long-Range Interactions in Quantum Systems”, San Sebastián, Spain (September 7, 2023).
132. *Many-body physics of two-dimensional materials and ultracold atoms*,
Invited talk at the “Teekolloquium”, Max-Planck Institute of Nuclear Physics, Heidelberg, Germany (July 13, 2023).
131. *Particles in new clothes: From Quasiparticles to flat worlds*,
Physikalisches Kolloquium, Heidelberg University, Germany (June 23, 2023).
130. *From a polaron into a cluster: Fate of an impurity in a Bose Einstein condensate*,
Invited talk at the Condensed Matter Theory Seminar, Frankfurt University, Germany (January 25, 2023).
129. *From a polaron into a cluster: Fate of an impurity in a Bose Einstein condensate*,
Invited talk at the CQD Colloquium, Heidelberg University, Germany (January 18, 2023).
128. *Connecting two-dimensional materials and ultracold atoms*,
Invited talk at the STRUCTURES Jour fixe, Heidelberg, Germany (January 13, 2023).
127. *From a polaron into a cluster: Fate of an impurity in a Bose Einstein condensate*,
Invited talk at the 777th WE-Heraeus-Seminar: “Ultracold Quantum Matter: Basic Research and Applications”, Bad Honnef, Germany (December 16, 2022).
126. *Many-body physics of two-dimensional materials and ultracold atoms*,
Invited talk at the Scientific Advisory Board Review Meeting, Max Planck Institute of Quantum Optics, Garching, Germany (October 13, 2022).
125. *Many-body physics of two-dimensional materials and ultracold atoms*,
Invited talk at the Insights in Technology Workshop 2022, SIT—Jacobs University, Bremen, Germany (June 3, 2022).
124. *Exploring strongly correlated matter with Rydberg excitations in cold atoms and 2D semiconductors*,
Invited talk (online) at the GiRyd Status Workshop, Mainz, Germany (March 22, 2022).
123. *Some thoughts on Bose (and Fermi) Polarons*,
Invited talk at the Condensed Matter Seminar, ETH Zurich, Switzerland (March 17, 2022).
122. *Polaron physics with two-dimensional materials and ultracold atoms*,
Invited talk (online) at FermiPolar 2022, France (February 7, 2022).
121. *Many-body physics of two-dimensional materials and ultracold atoms*,
Invited talk (online) at the Munich Conference on QST 2021, Germany (July 20, 2021).
120. *Rydberg excitations as a probe of quantum many-body systems*,
Invited talk (online) at the GiRyd Status Workshop 2021, Germany (May 5, 2021).
119. *Bose Polarons at Strong Coupling*,
Invited talk (online) at the ITAMP Seminar, Harvard University/CFA, Cambridge, USA (March 25, 2021).
118. *Many-body physics of two-dimensional materials and ultracold atoms*,
Invited seminar talk (online) at Heidelberg University, Heidelberg, Germany (January 25, 2021).
117. *Many-body physics of two-dimensional materials and ultracold atoms*,
Invited seminar talk (online) at Stuttgart University, Stuttgart, Germany (December 10, 2020).
116. *Many-body physics of two-dimensional materials and ultracold atoms*,
Invited seminar talk (online) at Heidelberg University, Heidelberg, Germany (December 3, 2020).
115. *Many-body physics with cold atoms and atomically thin materials*,
Invited talk at the Symposium of the Max Planck Society, online (October 29, 2020).

114. *Many-body physics of cold atoms and two-dimensional materials*,
Invited seminar talk (online) at Bonn University, Bonn, Germany (October 5, 2020).
113. *Many-body physics of cold atoms and two-dimensional materials*,
Invited seminar talk at Aarhus (September 28, 2020).
112. *Many-body physics of cold atoms and two-dimensional materials*,
Invited talk at the Quantum Many-body Systems Seminar, Hamburg/online (June 16, 2020).
111. *Polarons and Trions at finite density*,
Invited talk at the TMD Meeting, Toulouse/online (May 06, 2020).
110. *Quantum simulation of advanced materials*,
Invited seminar talk at SIT, Schaffhausen, Switzerland/online (April 10, 2020).
109. *Rydberg Impurities in a Fermi sea*,
Invited talk at the GiRyd DFG Priority Programme Status Workshop/online (March 24, 2020).
108. *Rydberg Impurities in a Fermi sea*,
Invited talk at the Ultralong-Range Molecule Workshop, Lauenburg, Germany (February 4, 2020).
107. *Many-body physics of cold atoms and two-dimensional semiconductors*,
Invited talk at the Condensed Matter Seminar, University of Oklahoma, Norman, OK, USA (January 24, 2020).
106. *Exploring polarons: From cold atoms to two-dimensional materials*,
Physics Colloquium, University of Oklahoma, Norman, OK, USA (January 23, 2020).
105. *Many-body physics of cold atoms and two-dimensional materials*,
Invited talk at the Condensed Matter Seminar, University of Nottingham, UK (January 20, 2020).
104. *Polaronic effects in condensed matter and atomic systems*,
Invited talk at the International Workshop on Polarons in the 21st Century, ESI Vienna, Vienna, Austria (December 12, 2019).
103. *Many-body physics with cold atoms and two-dimensional material*,
Invited talk at the Scientific Advisory Board Meeting, Max-Planck Institute of Quantum Optics, Garching, Germany (October 9, 2019).
102. *Theory of electron-exciton scattering in atomically thin semiconductors*,
Invited talk at the Korrelationstage Dresden, MPIPKS Dresden (September 17, 2019).
101. *Theory of electron-exciton scattering in atomically thin semiconductors*,
Talk at the DPG Solid State Physics Spring Conference, Regensburg, Germany (April 05, 2019).
100. *Polaron formation in Rydberg systems and Rydberg excitations as a probe of correlated quantum matter*,
Invited talk at the GiRyd Status Workshop, University of Kaiserslautern, Kaiserslautern, Germany (March 25, 2019).
99. *Polaronic effects in condensed matter and atomic systems*,
Invited talk at the DPG AMO Physics Spring Conference, Rostock, Germany (March 14, 2019).
98. *Many-body physics with cold atoms and van der Waals materials*,
Invited talk at the International Workshop on Perspectives of Theoretical Physics, Cluster of Excellence AIM, University of Hamburg, Hamburg, Germany (March 02, 2019).
97. *Theory of electron-exciton scattering in atomically thin semiconductors*,
Invited talk at the Condensed Matter Theory Seminar, Max-Planck-Institute of Quantum Optics, Garching, Germany (January 11, 2019).
96. *Many-body physics with quantum impurities in cold atoms and beyond*,
Invited talk at the MPQ Theory Seminar, Max-Planck-Institute of Quantum Optics, Garching, Germany (January 09, 2019).

95. *Many-body physics with quantum impurities in cold atoms and beyond*,
Invited talk at the 685th WE-Heraeus-Workshop: Research Frontiers in Ultracold Quantum Gases, Bad Honnef, Germany (December 18, 2018).
94. *Many-body physics with quantum impurities in cold atoms and beyond*,
Invited talk at the Spectral Theory and Dynamics of Quantum Systems Seminar, Stuttgart, Germany (December 03, 2018).
93. *Many-body physics with quantum impurities in cold atoms and beyond*,
Invited talk at the Quantum Optics Seminar, Warsaw, Poland (November 15, 2018).
92. *Many-body physics with electrons and excitons in 2D semiconductors*,
Invited talk at the TMD Meeting, Toulouse, France (November 08, 2018).
91. *A new spin to atomtronics*,
Invited talk at the Group-Retreat Bloch Group, Benediktbeuren, Germany (September 18, 2018).
90. *A new spin to atomtronics*,
Invited talk at the CMT Seminar, MPIPKS, Dresden, Germany (September 13, 2018).
89. *A new spin to atomtronics*,
Invited talk at the CQOM/ITAMP Workshop "Quantum Simulations with Atoms and Light", Aarhus University, Aarhus, Denmark (August 14, 2018).
88. *Atomtronics with a spin*,
Invited talk at the Workshop on Polaron Physics, University of Barcelona, Barcelona, Spain (July 20, 2018).
87. *Many-body physics with quantum impurities in cold atoms and beyond*,
Invited talk at the Condensed Matter Theory Seminar, Heidelberg, Germany (July 17, 2018).
86. *Many-body physics with quantum impurities in cold atoms and beyond*,
Invited talk at the Theoretical Physics Seminar, University of Sussex, Brighton, United Kingdom (May 21, 2018).
85. *From few- to many-body physics with quantum impurities in fermionic systems*,
Invited talk at the 2nd International Workshop on Rydberg Excitons in Semiconductors, IAS Aarhus, Aarhus, Denmark (May 3, 2018).
84. *Rotation of Quantum Impurities in Presence of a Many-Body Environment*,
Invited talk at the CMT Seminar, Paul Scherrer Institute, Villingen, Switzerland (April 17, 2018).
83. *Many-body physics with quantum impurities in cold atoms and beyond*,
Invited talk at the GiRyd Seminar, Hamburg, Germany (March 22, 2018).
82. *Polaron physics with ultracold atoms*,
Talk at the DPG Spring Conference, Erlangen, Germany (March 05, 2018).
81. *A New Spin on Atomtronics*,
Invited talk at the Grimm Retreat Seminar, Maria Waldrast, Austria (March 01, 2018).
80. *Rotation of Quantum Impurities in Presence of a Many-Body Environment*,
Invited talk at the FOR 2247 Annual Meeting, MPQ, Garching, Germany (February 05, 2018).
79. *Many-body physics with quantum impurities in ultracold atoms and beyond*,
Invited talk at the Condensed Matter Theory Seminar, LMU, Munich, Germany (February 02, 2018).
78. *Polaron physics with ultracold atoms and beyond*,
Invited talk at the IMPRS – QST Seminar, MPI of Quantum Optics, Garching, Germany (January 25, 2018).
77. *Many-body physics with quantum impurities in cold atoms and beyond*,
Theoretisch Physikalisches Kolloquium, TU Kaiserslautern, Germany (November 29, 2017).
76. *Many-body physics with quantum impurities in cold atomic system*,
Invited talk at the GiRyd Workshop, Dresden, Germany (November 28, 2017).

75. *Many-body physics with quantum impurities in cold atoms and beyond*,
Invited seminar talk at TU Munich, Garching, Germany (November 22, 2017).
74. *Effect of localized defects on Fermi polarons in transition metal dichalcogenides*,
Invited talk at the Institute for Quantum Electronics Seminar, ETH Zürich, Switzerland (November 16, 2017).
73. *Many-body physics with quantum impurities in cold atoms and beyond*,
Invited talk at the Seminar of the National Center for Quantum Science and Technology, ETH Zürich, Switzerland (November 14, 2017).
72. *Many-body physics with quantum impurities in cold atoms and beyond*,
Colloquium of the Center for Quantum Optics and Quantum Matter, Aarhus University, Aarhus, Denmark (November 11, 2017).
71. *Many-body physics with ultracold atoms*,
Invited talk at ICPEAC, Cairns, Australia (July 26, 2017).
70. *Rydberg molecules and polarons*,
Invited talk at the 48th Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics (DAMOP), Sacramento, USA (June 8, 2017).
69. *Impurity-Hybridized polarons in transition metal dichalcogenides*,
Invited talk at the TMD Meeting, Harvard University, Cambridge, USA (May 19, 2017).
68. *Many-body physics of quantum impurities*,
Talk at the NSF Site Visit, Harvard-Smithsonian Center for Astrophysics, Cambridge, USA (April 10, 2017).
67. *Polaron physics with ultracold atoms and Rydberg excitations*,
Invited talk at the AMO Seminar, Rice University, Houston, USA (April 6, 2017).
66. *Angulons: Rotation of Quantum Impurities in Presence of a Many-Body Environment*,
Invited seminar talk at Harvard University, Cambridge, USA (March 28, 2017).
65. *Exploring novel states of matter in complex quantum systems*,
Invited seminar talk at the University of Cambridge, UK (February 13, 2017).
64. *Exploring novel states of matter with quantum hybrid systems*,
Invited talk at the MPG Symposium 2017, Berlin, Germany (January 31, 2017).
63. *Many-body interferometry of magnetic polaron dynamics*,
Invited talk at the CUA Retreat 2017, Plymouth, NH, USA (January 17, 2017).
62. *Many-body physics with ultracold atoms – from quantum impurities to antiferromagnetism*,
Invited seminar talk at ICOQI, Innsbruck, Austria (October 18, 2016).
61. *Full counting statistics of staggered magnetization in the Heisenberg antiferromagnet*,
Invited seminar talk at Harvard University, Cambridge, USA (September 21, 2016).
60. *Control and probe of matter with quantum impurities*,
Invited talk at the Center for Ultrafast Imaging, DESY, Hamburg, Germany (July 4, 2016).
59. *A Mesoscopic Rydberg Impurity in an atomic quantum gas*,
Talk at the 47th Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics, Providence, Rhode Island, USA (May 25, 2016).
58. *Control and probe of matter with quantum impurities*,
Invited talk at the ITAMP Seminar, Harvard-Smithsonian Center for Astrophysics, Cambridge, USA (May 12, 2016).
57. *A Mesoscopic Rydberg Impurity in an atomic quantum gas – from fast dynamics to many-body absorption spectra*,
Invited talk at the Mathematical Physics Seminar, IST Austria, Klosterneuburg, Austria (April 13, 2016).
56. *A Mesoscopic Rydberg Impurity in an atomic quantum gas – from fast dynamics to many-body absorption spectra*,
Invited seminar talk at TU Vienna, Vienna, Austria (April 5, 2016).

55. *Response functions of an impurity in BEC*,
Invited seminar talk at Harvard University, Cambridge, USA (March 25, 2016).
54. *A mesoscopic impurity in an atomic quantum gas*,
Invited talk at the ITAMP / HQOC Seminar, Harvard University, Cambridge, USA
(March 3, 2016).
53. *A mesoscopic impurity in an atomic quantum gas*,
Invited talk at the Center for Ultrafast Imaging, DESY, Hamburg, Germany (December
2, 2015).
52. *A mesoscopic impurity in an atomic quantum gas*,
Invited talk at the JILA Seminar, JILA, University of Colorado/NIST, Boulder, USA
(November 16, 2015).
51. *Dynamic finite temperature response of impurities in a Fermi sea – from mesoscopic
physics to ultracold atoms*,
Invited talk at the ITAMP Seminar, Harvard-Smithsonian Center for Astrophysics,
Cambridge, USA (October 2, 2015).
50. *Dynamic finite temperature response of impurities in a Fermi sea – from mesoscopic
physics to ultracold atoms*,
Invited talk at the CUA Seminar, MIT, Cambridge, USA (September 30, 2015).
49. *Dynamic finite temperature response of impurities in a Bose gas*,
Invited seminar talk at Harvard University, Cambridge, USA (August 24, 2015).
48. *Dynamic finite temperature response of impurities in a Fermi sea*,
Invited seminar talk at Harvard University, Cambridge, USA (July 7, 2015).
47. *Decoherence of impurities in ultracold quantum gases*,
Invited talk at the Oberseminar Mathematische Physik, University Heidelberg, Ger-
many (June 29, 2015).
46. *Decoherence of impurities in ultracold atoms*,
Talk at the POLATOM Conference 2015, Bad Honnef, Germany (June 22, 2015).
45. *Decoherence and absorption spectra of impurities in ultracold quantum gases*,
Talk at the 46th Annual Meeting of the APS Division of Atomic, Molecular and Opti-
cal Physics, Columbia, USA (June 10, 2015).
44. *Rotation of quantum impurities in the presence of a many-body environment*,
Talk at the 46th Annual Meeting of the APS Division of Atomic, Molecular and Opti-
cal Physics, Columbus, USA (June 9, 2015).
43. *Decoherence of impurities in ultracold quantum gases*,
Invited talk at the SFB/TRR 21 Seminar, University Stuttgart, Germany (June 5, 2015).
42. *Decoherence and absorption spectra of impurities in cold quantum gases*,
Invited talk at the IQOQI Seminar, IQOQI, Innsbruck, Austria (April 16, 2015).
41. *Decoherence and absorption spectra of impurities in cold quantum gases*,
Invited talk at the Mathematical Physics Seminar, Institute of Science and Technol-
ogy, Klosterneuburg, Austria (February 04, 2015).
40. *Heavy impurities in quantum gases*,
Talk at the ARO-MURI Review Workshop, Rice University, Houston, USA (January 9,
2015).
39. *Quantum Impurities – A Challenge for Quantum Simulation with Ultracold Atoms*,
Invited talk at the Physics Seminar, Institute of Advanced Studies, Tsinghua Univer-
sity, Beijing, China (October 29, 2014).
38. *Field-theoretical Study of the Bose Polaron – Challenges for Quantum Simulation
with ultracold Atoms*,
Sonderkolloquium des SFB/TR 49, Kaiserslautern, Germany (September 4, 2014).
37. *The Bose polaron – Challenge for quantum simulation with ultracold atoms*,
Invited talk at the AIAS international conference: Cold atoms and beyond 2014,
Aarhus, Denmark (June 25, 2014).

36. *The Bose polaron*,
Invited talk at the Harvard Condensed Matter Kids Seminar, Harvard University, Cambridge, USA (April 22, 2014).
35. *Efimov physics beyond universality with ultracold atoms*,
Talk at the INT Program 14-1 Workshop "Universality in Few-Body Systems", Seattle, USA (March 25, 2014).
34. *The Bose polaron – Challenge for quantum simulation with ultracold atoms*,
Talk at the March Meeting of the German Physical Society, Berlin, Germany (March 19, 2014).
33. *The Bose polaron – Challenge for quantum simulation with ultracold atoms*,
Talk at the March Meeting of the American Physical Society, Denver, USA (March 05, 2014).
32. *Efimov physics beyond universality*,
Invited talk at the AMO Physics Seminar, University of Connecticut, Storrs, USA (February 24, 2014).
31. *The Bose polaron – Challenges for quantum simulation with ultracold atoms*,
Invited talk at the Complex Systems Seminar, Universität Heidelberg, Germany (January 8, 2014).
30. *The Bose polaron – Challenges for quantum simulation with ultracold atoms*,
Invited seminar talk at Universität Hamburg, Germany (January 7, 2014).
29. *Ultracold multicomponent Fermi gases: From spin instabilities to induced superfluidity*,
Invited talk at the Condensed Matter Theory Seminar, Technische Universität München, Germany (December 19, 2013).
28. *Ultracold multicomponent Fermi gases: From spin instabilities to induced superfluidity*,
Invited seminar talk at Harvard University, Cambridge, USA (December 13, 2013).
27. *The Bose polaron – Challenges for quantum simulation with ultracold atoms*,
Invited talk at the ITAMP Seminar, ITAMP, Cambridge, USA (October 10, 2013).
26. *From few- to many-body physics with ultracold atoms*,
Invited seminar talk at Technische Universität München, Germany (June 24, 2013).
25. *Functional RG for cold atoms – From many-body polaron to few-body Efimov physics*,
Invited seminar talk at IQOQI, Innsbruck, Austria (February 18, 2013).
24. *Functional RG for cold atoms – From many-body polaron to few-body Efimov physics*,
Invited seminar talk at the University of Massachusetts, Amherst, USA (February 4, 2013).
23. *Functional RG for cold atoms – From many-body polaron to few-body Efimov physics*,
Invited seminar talk at Harvard University, Cambridge, USA (January 31, 2013).
22. *Efimov physics beyond universality*,
Invited seminar talk at LENS, Firenze, Italy (November 5, 2012).
21. *Functional RG for cold atoms: From many-body polaron to few-body Efimov physics*,
Invited talk at the 6th Conference on Exact Renormalization Group, Aussois, France (September 7, 2012).
20. *Fermi polarons in two dimensions and news from Efimov physics beyond universality*,
Invited talk at the International Workshop on Quark Gluon Plasma meets Cold Atoms – Episode III, Hirschegg, Austria (August 29, 2012).
19. *Efimov physics beyond universality*,
Invited talk at the Retreat of the Innsbruck group of Rudi Grimm, Maria Waldrast, Austria (February 29, 2012).
18. *Renormalization group flow of spectral functions for ultracold quantum gases*,
Invited talk at the Yukawa International Molecule Workshop on Renormalization Group Approach from Ultra Cold Atoms to the Hot QGP, Kyoto, Japan (August 31, 2011).

17. *Renormalization group flow of spectral functions: Excitation spectra and rf response near the polaron-to-molecule transition*,
Invited talk at the Retreat of Grimm group, Maria Waldrast, Austria (July 27, 2011).
16. *Renormalization group flow of spectral functions for ultracold quantum gases*,
Invited seminar talk at Universität Heidelberg, Germany (July 5, 2011).
15. *Renormalization group flow of spectral functions for ultracold quantum gases*,
Invited talk at the Seminar of Research Training Group, University of Jena, Germany (June 28, 2011).
14. *Renormalization group flow of spectral functions: Excitation spectra and rf response near the polaron-to-molecule transition*,
Talk at the German Science Foundation (DFG) research unit FOR 801 – International Workshop, Hamburg, Germany (June 23, 2011).
13. *Spectral functions from the fRG: Excitation spectra and rf response near the polaron-to-molecule transition*,
Invited talk at the Condensed Matter Theory Seminar, TU München, Germany (May 26, 2011).
12. *The Fermi polaron: Functional RG with full frequency and momentum dependence*,
Invited talk at the ColdQuantumCoffee-Seminar, Universität Heidelberg, Germany (November 2, 2010).
11. *The Fermi polaron: Functional RG with full frequency and momentum dependence*,
Invited talk at the Condensed Matter Theory Seminar, Frankfurt, Germany (October 29, 2010).
10. *The Fermi polaron in cold atoms: funRG with full frequency and momentum dependence*,
Talk at the 5th International Conference on the Exact Renormalization Group, Corfu, Greece (September 18, 2010).
9. *Few-body Physics with Multicomponent Quantum Gases*,
Invited talk at the DFG Research Unit 801 Meeting, Munich, Germany (October 06, 2009).
8. *Functional renormalization group approach to the four-body problem*,
Talk at the 19th International IUPAP Conference on Few-Body Problems in Physics, Bonn, Germany (August 31, 2009).
7. *Few-body Physics with Ultracold Fermi Gases*,
Talk at the International Workshop on Quark-Gluon Plasma meets Cold Atoms – Episode II, Riezlern, Austria (August 7, 2009).
6. *Trion Formation in Ultracold Fermi Gases*,
Invited seminar talk at IQOQI Innsbruck, Austria (June 19, 2009).
5. *Trion Formation in Ultracold Fermi Gases*,
Invited seminar talk at Technische Universität München, Germany (March 31, 2009).
4. *Trion Formation in Ultracold Fermi Gases*,
Invited talk at the ColdQuantumCoffee-Seminar, Universität Heidelberg, Germany (February 3, 2009).
3. *Three species Fermion Gases*,
Invited talk at the EMMI-Seminar, Universität Heidelberg, Germany (July 07, 2008).
2. *Trion Formation in Ultracold Fermi Gases*,
Invited talk at the ColdQuantumCoffee-Seminar, Universität Heidelberg, Germany (May 27, 2008).
1. *Representations of spin 1/2 particles, Dirac Equation and the role of mass*,
Invited talk at the NUPAC Seminar, University of New Mexico, Albuquerque, USA (May 2, 2006).