

Curriculum Vitae Louk Rademaker

Main Research Positions

September 2018 – August 2022	Ambizione Fellow, Université de Genève, Switzerland Based on an Ambizione grant from the SNSF, to work on ‘ <i>Sluggish quantum matter – Slow dynamics in many-body localized and glassy systems</i> ’
September 2017 – August 2018	Senior Postdoctoral Researcher, Perimeter Institute for Theoretical Physics, Waterloo, Canada A five-year senior position, which I left early because of family reasons.
September 2014 – August 2017	Postdoctoral Researcher, Kavli Institute for Theoretical Physics, University of California, Santa Barbara, USA With a <i>Rubicon</i> grant from the NWO, based on my proposal ‘ <i>What’s the matter with frustration? Highly fluctuating phases in frustrated complex oxides</i> ’, I worked as a postdoc at the KITP.

Education

December 2013	PhD Theoretical Physics, Leiden University Thesis: " <i>Fermions and Bosons: Excitons in strongly correlated materials</i> " Supervisors: Jan Zaanen and Hans Hilgenkamp
September 2008	MSc Theoretical Physics, Leiden University Thesis: " <i>Phase Transitions in Matrix Models</i> " (high energy physics), graduated with distinction Supervisor: Koenraad Schalm
September 2006	BSc Mathematics and BSc Astronomy, Leiden University Thesis: " <i>Shock waves through inhomogeneous media</i> " Supervisors: Vincent Icke and Vivi Rötttschafer

Skills

- Fluent in Dutch, English; intermediate level (CEF level B1) in French; basic level in German and Russian.
- Highly skilled in Fortran and Mathematica, basic knowledge of C++ and Python.
- Trained in classical Monte Carlo, Determinant Quantum Monte Carlo, diagrammatic techniques (including Eliashberg theory), Dynamical Mean Field Theory and ab initio methods (Quantum Espresso).
- International collaborations in US, Canada, Chile, Spain, France, the Netherlands, Switzerland and Japan.
- Organized local seminar series at all my positions, and various national and international conferences and workshops. Currently organizer and founder of the “Flat Club” in Genève, a weekly seminar on two-dimensional materials.
- Referee for several high-quality journals, including Science, Physical Review Letters, Nature Communications, Europhysics Letters and Physical Review B.

Contact Information

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Google Scholar	scholar.google.com/citations?user=y4RGP0wAAAAJ
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Other Positions

December 2016 – February 2017	Parental leave Taking care of my new-born daughter Stefania.
January 2014 – July 2014	Temporary researcher, Leiden University I continued working with Jan Zaanen on quantum matter, spin ices and correlated thermoelectrics. From May onwards I worked with Tjerk Oosterkamp on the microwave circuits.
January 2013 – February 2013	Visiting scholar, National High Magnetic Field Laboratory, Tallahassee, United States Visiting the group of Vladimir Dobrosavljevic to study the influence of long-range interactions on stripe formation and glasses; and to learn DMFT.
July 2009 – August 2009	Visiting student, Stanford University, USA Visiting the group of Tom Devereaux and Jeroen van den Brink to learn DQMC.
March 2006 – March 2014	Elected City Council Member, City Council of Leiden The City of Leiden has about 120000 inhabitants and an annual budget of about 500 million euro. Served as member of the Urban Development Committee, the Regional Affairs Committee, the Committee for Social Welfare & Economics and the Budget Committee. Elected in March 2006, re-elected for a second term in March 2010.
January 2008 – December 2008	Strategy Consultant, Instituut voor Maatschappelijke Innovatie (IMI) Part-time position as consultant at the 'Institute for Social Innovation'. Main project was to advise the Ministry of Infrastructure on the long-term future of highway construction.
May 2004 – May 2005	Teacher in Economics, Stichting Studiebegeleiding Leiden (SSL) Teaching intensive 3-day courses in economics for high school students.
May 2004 – March 2006	Political Assistant, Provinciale Staten van Zuid-Holland Assisting the State Parliament of South-Holland.

Publication List

1. **L. Rademaker**, Y. Wang, S. Johnston, *Effects of dynamical Coulomb screening in monolayer FeSe/SrTiO₃ substrates with forward scattering electron-phonon coupling*, in preparation (2020).
2. **L. Rademaker**, A Practical Introduction to Density Functional Theory, arXiv:2011.09888 (2020).
3. **L. Rademaker**, M. Gibertini, *Gate-tunable imbalanced Kane-Mele model in encapsulated bilayer jacutingaite*, arXiv:2007.09926 (2020).
4. Y. Saito, J. Ge, **L. Rademaker**, K. Watanabe, T. Taniguchi, D. A. Abanin, A. F. Young, *Hofstadter subband ferromagnetism and symmetry broken Chern insulators in twisted bilayer graphene*, accepted for publication in Nature Physics (2020); arXiv:2007.06115.
5. **L. Rademaker**, I. Protopopov, D. Abanin, *Topological Flat Bands and Correlated States in Twisted Monolayer-Bilayer Graphene*, Phys Rev. Research 2, 033150 (2020); arXiv:2004.14964.
6. S. Lisi, X. Lu, T. Benschop, T. A. de Jong, P. Stepanov, J. R. Duran, F. Margot, I. Cucchi, E. Cappelli, A. Hunter, A. Tamai, V. Kandyba, A. Giampietri, A. Barinov, J. Jobst, V. Stalman, M. Leeuwenhoek, K. Watanabe, T. Taniguchi, **L. Rademaker**, S. J. van der Molen, M. Allan, D. K. Efetov, and F. Baumberger, *Observation of flat bands in twisted bilayer graphene*, Nature Physics (2020); arXiv:2002.02289.
7. **L. Rademaker**, D. A. Abanin, *Bridging the Gap Between Many-Body Localization and Quantum Spin Glasses*, arXiv:1910.04421 (2019).
8. **L. Rademaker**, A. J. Beekman, J. van Wezel, *Stability and Absence of a Tower of States in Ferrimagnets*, Phys. Rev. Research 2, 013304 (2020), arXiv:1909.11381.
9. **L. Rademaker**, *Exact Ground State of Lieb-Mattis Hamiltonian as a Superposition of Néel states*, Phys. Rev. Research 1, 032018(R) (2019); arXiv:1909.09663.
10. A. J. Beekman, **L. Rademaker**, J. van Wezel, *An Introduction to Spontaneous Symmetry Breaking*, SciPost Phys. Lect. Notes 11 (2019); arXiv:1909.01820.
11. **L. Rademaker**, D. A. Abanin, P. Mellado, *Charge Smoothing and Band Flattening due to Hartree corrections in Twisted Bilayer Graphene*, Phys. Rev. B 100, 205114 (2019); arXiv:1907.00940.
12. M. Ortuño, A. M. Somoza, **L. Rademaker**, *Construction of Many-Body Eigenstates with Displacement Transformations*, Phys. Rev. B 100, 085115 (2019); arXiv:1901.10368.
13. T. H. A. van der Reep, **L. Rademaker**, X. G. A. Le Large, R. H. Guis, T. H. Oosterkamp, *An experimental proposal to study spontaneous collapse of the wave function using two travelling wave parametric amplifiers*, accepted for publication in Phys. Status Solidi B (2020); arXiv:1811.01698.
14. **L. Rademaker**, and P. Mellado, *Charge-transfer insulation in twisted bilayer graphene*, Phys. Rev. B 98, 235158 (2018); arXiv:1805.05294.
15. **L. Rademaker**, *Quenching the Kitaev honeycomb model*, SciPost Phys. 7, 071 (2019); arXiv:1710.09761.
16. **L. Rademaker**, J. Zaanen, *Quantum Thermalization and the Expansion of Atomic Clouds*, Sci. Rep. 7, 6118 (2017); arXiv:1703.02489.
17. Y. Wang, **L. Rademaker**, E. Dagotto, and S. Johnston, *Phonon linewidth due to electron-phonon interactions with strong forward scattering in FeSe thin films on oxide substrates*, Phys. Rev. B. 96, 054515 (2017); arXiv:1703.02013.

18. **L. Rademaker**, M. Ortuno, and A. M. Somoza, *Many-body localization and delocalization from the perspective of Integrals of Motion*, Ann. Phys. (Berlin) 529, 1600322 (2017); arXiv:1610.06238.
19. **L. Rademaker**, V. V. Vinokur, and A. Galda, *Universality and critical behavior of the dynamical Mott transition in a system with long-range interactions*, Sci. Rep. 7, 44044 (2017); arXiv:1608.07779.
20. **L. Rademaker**, Z. Nussinov, L. Balents, and V. Dobrosavljevic, *Suppressed Density of States in Self-Generated Coulomb Glasses*, New J. Phys. 20, 043026 (2018); arXiv:1605.01822.
21. Y. Wang, K. Nakatsukasa, **L. Rademaker**, T. Berlijn, and S. Johnston, *Aspects of electron-phonon interactions with strong forward scattering in FeSe Thin Films on SrTiO₃ substrates*, Supercond. Sci. Technol. 29, 054009 (2016); arXiv:1602.00656.
22. **L. Rademaker** and J. A. Mydosh, *Quantum Critical Matter and Phase Transitions in Rare-Earths and Actinides*, Handbook of Chemistry and Physics of Rare Earths and Actinides, Vol. 49, 293 (2016).
23. **L. Rademaker**, A. Ralko, S. Fratini and V. Dobrosavljevic, *Avoiding Stripe Order: Emergence of the Supercooled Electron Liquid*, J. Supercond. Nov. Magn. 29, 601 (2016); arXiv:1508.03065.
24. **L. Rademaker**, M. Ortuno, *Explicit Local Integrals of Motion for the Many-Body Localized State*, Phys. Rev. Lett. 116, 010404 (2016); arXiv:1507.07276.
25. **L. Rademaker**, *The Tower of States and the Entanglement Spectrum in a Coplanar Antiferromagnet*, Phys. Rev. B 92, 144419 (2015); arXiv:1507.04402.
26. **L. Rademaker**, Y. Wang, T. Berlijn and S. Johnston, *Enhanced superconductivity due to forward scattering in FeSe thin films on SrTiO₃ substrates*, New J. Phys. 18, 022001 (2016); arXiv:1507.03967.
27. R.-J. Slager, **L. Rademaker**, J. Zaanen and L. Balents, *Impurity Bound States and Greens Function Zeroes as Local Signatures of Topology*, Phys. Rev. B 92, 085126 (2015); arXiv:1504.04881.
28. S. Mahmoudian, **L. Rademaker**, A. Ralko, S. Fratini and V. Dobrosavljevic, *Glassy dynamics in geometrically frustrated Coulomb liquids without disorder*, Phys. Rev. Lett. 115, 025701 (2015); arXiv:1412.4441.
29. **L. Rademaker**, T. van der Reep, N. Van den Broeck, B. van Waarde, M. de Voogd and T. Oosterkamp, *The Instability of a Quantum Superposition of Time Dilations*; arXiv:1410.2303 (2014)
30. K. Wu, **L. Rademaker** and J. Zaanen, *Bilayer Excitons in Two-Dimensional Nanostructures for Greatly Enhanced Thermoelectric Efficiency*, Phys. Rev. Applied 2, 054013 (2014); arXiv:1401.7770.
31. **L. Rademaker**, S. Johnston, J. Zaanen and J. van den Brink, *Determinant quantum Monte Carlo study of exciton condensation in the bilayer Hubbard model*, Phys. Rev. B 88, 235115 (2013); arXiv:1310.0623.
32. **L. Rademaker**, J. van den Brink, J. Zaanen and H. Hilgenkamp, *Exciton condensation in strongly correlated electron bilayers*, Phys. Rev. B 88, 235127 (2013); arXiv:1310.0685.
33. **L. Rademaker**, Y. Pramudya, J. Zaanen and V. Dobrosavljevic, *Influence of long-range interactions on charge ordering phenomena on a square lattice*, Phys. Rev. E 88, 032121 (2013); arXiv:1306.4765.
34. **L. Rademaker**, J. van den Brink, H. Hilgenkamp and J. Zaanen, *Enhancement of spin propagation due to interlayer exciton condensation*, Phys. Rev. B 88, 121101(R) (2013); arXiv:1304.3643.
35. **L. Rademaker**, K. Wu and J. Zaanen, *Dynamics of a single exciton in strongly correlated bilayers*, New J. Phys. 14, 3040 (2012); arXiv:1202.3616.
36. **L. Rademaker**, K. Wu, H. Hilgenkamp and J. Zaanen, *The dynamical frustration of interlayer excitons delocalizing in bilayer quantum antiferromagnets*, Europhys. Lett. 97, 27004 (2012); arXiv:1106.5347.

37. **L. Rademaker**, J. Zaanen and H. Hilgenkamp, *Prediction of quantization of magnetic flux in double-layer exciton superfluids*, Phys. Rev. B 83, 012504 (2011); arXiv:1009.1793.

38. **L. Rademaker**, *PhD Thesis: Fermions and Bosons: Excitons in strongly correlated materials*, Leiden University (2013).

Grants and scholarships

- **Rubicon grant (2014) from NWO**

Amount: € 127.690,-

Duration: 2 years (September 2014 – August 2016)

The grant allowed me to be a postdoctoral researcher at the KITP in Santa Barbara. The topic of the proposal was '*What's the matter with frustration? Highly fluctuating phases in frustrated complex oxides*'.

- **Ambizione grant (2017) from SNSF**

Amount: € 517.327,-

Duration: 4 years (September 2018 – August 2022)

Since September 2018 I am a senior researcher at the University of Geneva. The title of the proposal is '*Sluggish quantum matter – Slow dynamics in many-body localized and glassy systems*'. The goal of this research project is to investigate the origins of slow dynamic in many-body localized systems and in self-generated glasses. In particular, I will apply quantum information techniques common in the MBL community to the problems of glassformation.

Awards and Honors

- **Selected Superconductor Science and Technology Highlight 2016** for our paper '*Aspects of electron-phonon interactions with strong forward scattering in FeSe Thin Films on SrTiO₃ substrates*'. Awarded in February 2017.
- **Early Career Award 2016** from the Handbook on the Physics and Chemistry of Rare Earths, for my contribution '*Quantum Critical Matter and Phase Transitions in Rare Earths and Actinides*' published in Volume 49. Awarded in January 2017.
- **Best 2016 Scientific Paper Award of the Computer Science and Mathematics Division at the Oak Ridge National Laboratory** for 'providing new insight into enhancing superconductivity via the engineering of interfaces between materials', as proposed in our paper '*Enhanced superconductivity due to forward scattering in FeSe thin films on SrTiO₃ substrates*'. Awarded in January 2017.
- **Runner-up at the Best Poster Presentation award at the DRSTP Trends in Theory conference**, Dalfsen, The Netherlands, May 2013.
- **Winner of the Best Oral Presentation award at the Casimir Spring School**, Arnemuiden, The Netherlands, June 2010.
- **Winner of the Shell Stipendium 2008**, for best Master students in Theoretical Physics in The Netherlands, Rijswijk, The Netherlands, October 2008.
- **Participant of Stockholm International Youth Science Seminar**, an international seminar centered around the Nobel Prize ceremony, Stockholm, Sweden, December 2004.
- **Participant of European Union Contest for Young Scientists**, Vienna, Austria, September 2002.
- **Winner of the National Contest for Young Scientist**, for research on the binary star SS 433, Amsterdam, The Netherlands, March 2002.

Co-organizer of:

- '**Flat Club**' seminar series; on average weekly seminar at the Université de Genève on theory and experiments on two-dimensional materials. Initiated by me in February 2019.

- **Perimeter Institute Condensed Matter Seminar series**; an on average weekly seminar, from September 2017 to August 2018.
- **KITP Locals lunches and retreat** in 2014-2017. Meetings were held on an irregular basis at the Kavli Institute for Theoretical Physics and contain talks by members and postdocs - amongst the speakers were David Gross, Matthew Fisher and Boris Shraiman.
- **Trends in Theory**, 16-17 May 2013. Biannual conference of the Dutch Research School of Theoretical Physics, Dalfsen, The Netherlands. Key-note speakers were amongst others Xiao-Gang Wen and Mischa Katsnelson.
- **DRSTP PhD Day** in 2011, 2012 and 2013. Annual conference for Ph.D. students in Theoretical Physics in The Netherlands.

Invited talks and other presentations

2020

- **DQMP Seminar**, University of Geneva, Switzerland, *Understanding Correlated Insulators with Moiré-Wigner-Mott crystals in WS_2/WSe_2* , 24 November 2020.
- Contributed talk at the Flat Band Moiré Symposium at #CMD2020GEFES, <http://www.cmd2020gefes.eu/>, *Correlated Topology in Twisted Graphene Sandwiches*, 3 September 2020.
- **Invited talk** at the Online Summer Seminars for Correlated Electrons and Frustrated Magnets <https://sites.google.com/umn.edu/cm-weekly-seminar/home>, *Correlated Topology in Twisted Graphene Sandwiches*, 1 September 2020.
- **Invited talk** at the workshop ‘Electronic Correlations and Topology in Narrow Band Systems’, International Institute of Physics, Natal, Brazil, June 25 to July 03, 2020. (Cancelled due to Covid-2019)
- ToolBoX Seminar, University of Geneva, Switzerland, *A Practical Introduction to Density Functional Theory*, 12-13 March 2020.
- Contributed talk at the APS March Meeting 2020, Denver, CO, USA, *Charge Smoothing and Band Flattening due to Hartree corrections in Twisted Bilayer Graphene*, 3 March 2020. (Cancelled due to Covid-2019)
- ‘Flat Club’ meeting, University of Geneva, Switzerland, *High T_c in monolayer FeSe*, 14 February 2020.
- Seminar at the Paul Scherrer Institute, Switzerland, *Correlations with a twist*, 4 February 2020.
- Seminar at ETH Zurich, Switzerland, *Strong correlations with a twist*, 23 January 2020.

2019

- ‘Flat Club’ meeting, University of Geneva, Switzerland, *Quantum Anomalous Hall Effect in Twisted Bilayer Graphene*, 11 October 2019.
- **Invited talk** at the Conference on “Complex Quantum Systems out of Equilibrium”, Murcia, Spain, 26-30 August 2019.
- **Invited talk** at the “Mottness, Poor Conductors, and Strange Metals” Workshop at the Tsung-Dao Lee Institute, Shanghai, China, August 19-23, 2019.
- Participant at the Aspen Center for Physics 2019 Summer program on “Moiré Materials: Strong Correlations in Synthetic Superlattices”, Aspen, Colorado, USA, 23 June – 7 July 2019.
- **Invited talk** at the 2019 ICTP meeting “Complex quantum systems out of equilibrium in many-body physics and beyond” in Yerevan, Armenia, 3-7 June 2019.

- Contributed talk at the conference “New Trends in Complex Quantum Systems Dynamics 2019” in Venezia, Italy, *Unconventional many-body localization in long-range quantum glasses*, 11 April 2019.
- ‘Flat Club’ inaugural meeting, University of Geneva, Switzerland, *Latest developments in Twisted Bilayer Graphene*, 22 February 2019.

2018

- Seminar at the Department of Quantum Matter Physics Forum, at University of Geneva, Switzerland, *Charge-transfer insulation and superconductivity in twisted bilayer graphene*, 11 December 2018.
- **Invited talk** at the ICTP-SAIFR Workshop on Strong Electron Correlations in Quantum Materials: Inhomogeneities, Frustration, and Topology, São Paulo, Brazil, *Charge-transfer insulation in twisted bilayer graphene*, 16 August 2018.
- **Invited talk** at the Gordon Research Seminar on Conductivity and Magnetism in Molecular Materials, Bryant University, Rhode Island, USA, *Charge Order and Spin Liquids in Frustrated Mott Organics*, 12 August 2018.
- Seminar at the Institut-Néel, CNRS Grenoble, France, *Quenching the Kitaev model*, 20 April 2018.
- Talk at the APS March Meeting, Los Angeles, USA, *Quenching the Kitaev model*, 8 March 2018.
- Seminar at the University of Tennessee, Knoxville, USA, *Quenching the Kitaev model*, 22 February 2018.
- Seminar at Trent University, Peterborough, Canada, *Quantum thermalization and its breakdown*, 31 January 2018.

2017

- Seminar at the University of Toronto, Canada, *Quenching the Kitaev model*, 18 October 2017.
- Talk at the Quantum Matter Day, Perimeter Institute, Waterloo, Canada, *Quantum thermalization and its breakdown*, 3 October 2017.
- APS March Meeting, New Orleans, LA, United States, *Quantum thermalization and the expansion of atomic clouds*, 13 March 2017.
- **Invited talk** at 'Topological Science Workshop' at Keio University, Hiyoshi Campus, Yokohama, Japan, *Thermalization in Quantum Systems - and its breakdown*, 24 February 2017.
- **Invited talk** at the Workshop 'Theory of Correlated Topological Materials' at the University of Tokyo, Japan, *Thermalization in Quantum Systems - and its breakdown*, 23 February 2017.

2016

- Seminar at the TU Dresden, Germany, *Thermalization in Quantum Systems - and its breakdown*, 28 November 2016.
- Seminar at the Perimeter Institute, Waterloo, Canada, *Thermalization in Quantum Systems - and its breakdown*, 23 November 2016.
- Seminar at Oxford University, United Kingdom, *MBL-to-Ergodic Transition from the perspective of Integrals of Motion*, 30 August 2016.
- **Invited talk** at the 16th International Conference on Transport in Interacting Disordered Systems (TIDS16) in Granada, Spain, *MBL-to-Ergodic Transition from the perspective of Integrals of Motion*, 23 August 2016.
- IRG-2 Seminar at the Material Research Laboratory at UC Santa Barbara, USA, *Electron glasses without quenched disorder in Organic Crystals*, 10 June 2016.
- Contributed talk at the International Conference on Superconductivity and Magnetism, Fethiye, Turkey, *New theoretical tools for quantum glasses, with and without quenched disorder*, 29 April 2016.

- **Invited talk** at the APS March Meeting, *New theoretical tools for quantum glasses, with and without quenched disorder*, 15 March 2016.
- Special Condensed Matter Seminar at the Abdus Salam ICTP, Trieste, Italy, *New theoretical tools for quantum glasses, with and without quenched disorder*, 25 February 2016.
- Hard Times group meeting talk, University of California, Santa Barbara, USA, *Impurity Bound States and Greens Function Zeroes as Local Signatures of Topology*, 29 January 2016.

2015

- **Invited talk** at SPICE-Workshop on Bad Metal Behavior in Mott Systems, Mainz, Germany, *Glassy dynamics in geometrically frustrated Coulomb liquids*, 30 June 2015.
- Café KITP, public outreach talk with the title *Quasiparticles - The Dreams that Stuff is Made Of*, Santa Barbara, CA, United States, 7 May 2015.
- APS March Meeting, San Antonio, TX, United States, *Efros-Shklovskii Coulomb gap in the absence of disorder*, 5 March 2015.
- 'Hot Topic Talk' at the National High Magnetic Field Laboratory, Tallahassee, FL, United States, *Glassy dynamics in geometrically frustrated Coulomb liquids without disorder*, 13 January 2015.

2014

- Seminar at Lorentz Institute, Leiden University, The Netherlands, *Self-generated electron glasses in frustrated organic crystals*, 4 December 2014.
- Theoretical Physics Seminar, Washington University, St. Louis, MO, United States, *Self-generated electron glasses in frustrated organic crystals*, 6 November 2014.
- APS March Meeting, Denver, CO, United States, *Dynamical frustration versus kinetic enhancement with excitons in strongly correlated bilayers*, 3-7 March 2014.

2013

- UK-NL Condensed Matter Meeting, Bristol, United Kingdom, *Dynamical frustration versus kinetic enhancement with excitons in strongly correlated bilayers*, 30-31 August 2013.
- National High Magnetic Field Laboratory Seminar, Tallahassee, FL, United States, *Bilayer Excitons in Strongly Correlated Materials*, 1 February 2013.

2012

- Interfaces and Correlated Electron systems UK tour, Bristol, United Kingdom, *Mott insulator bilayers*, 29 March 2012.
- Hilgenkamp group Seminar, Twente University, Enschede, The Netherlands, *Theoretical physics for experimentalists*, 1 February 2012.

2011

- BEC-meeting in the group of Stoof, Duine and De Morais Smith, Utrecht, the Netherlands, *Frustrated interlayer excitons in antiferromagnets*, 9 September 2011.
- Presentation in the group of professor Millis, Columbia University, New York, NY, United States, *Emergent Ising confinement of excitons in strongly correlated bilayers*, 16 May 2011.
- DRSTP School on Statistical Physics and Theory of Condensed Matter, Driebergen, the Netherlands, *Excitons and spins in strongly correlated systems*, 9 March 2011.

2010

- Casimir Spring School, Arnemuïden, the Netherlands, *Flux Quantization in Double Layer Exciton Superfluids*, 16 June 2010.

- DRSTP School on Statistical Physics and Theory of Condensed Matter, Driebergen, the Netherlands, *Magnetic Flux Quantization in Double Layer Exciton Superfluids*, 12 April 2010.

Teaching track record

- Lecturer, *Introduction to Density Functional Theory*, Spring 2020.
- Substitute lecturer for Prof. Leon Balents (*Condensed Matter Physics II*) and Prof. Matthew Fisher (*Graduate Quantum Mechanics*) at UC Santa Barbara (2014-2017)
- Teaching assistant, *Effective Field Theory* by professor Koenraad Schalm (Leiden University, Spring 2011, 2012 and 2013)
- Teaching assistant, *Quantum Field Theory* by professor Koenraad Schalm (Leiden University, Spring 2011, 2012 and 2013)
- Teaching assistant, *Quantum Field Theory* by professor Ana Achucarro (Leiden University, Spring 2010)
- Teaching assistant, *Theory of Condensed Matter* by professor Jan Zaanen (Leiden University, Spring 2009)
- Lecturer, *Introduction to LabView* (Khartoum University, Sudan, Spring 2008 and Spring 2012)
- Teaching experience as **Teacher in Economics** for high-school students at the **Stichting Studiebegeleiding Leiden (SSL)** in 2004 and 2005. At this company we organized intensive 3-day courses in Economics for students to prepare them for their high school exams. My reviews were very positive.

Five best papers

1. L. Rademaker, M. Ortuno,
Explicit Local Integrals of Motion for the Many-Body Localized State
Phys. Rev. Lett. **116**, 010404 (2016)
We provided a novel method to compute integrals of motion in a quantum system with interactions and disorder, based on 'displacement transformations'. Unlike others, our method can also compute the integrals of motion in a delocalized system. Cited 118 times.
2. L. Rademaker, Y. Wang, T. Berlijn and S. Johnston,
Enhanced superconductivity due to forward scattering in FeSe thin films on SrTiO₃ substrates
New J. Phys. **18**, 022001 (2016)
Our theory provides one of the most prominent explanations of enhanced superconductivity in single layer FeSe on STO substrates. It has inspired novel experiments (for example on the phonon linewidth) and lead to many theoretical discussions about the subtleties of two-dimensional superconductivity. Cited 100 times.
3. L. Rademaker, P. Mellado,
Charge-transfer insulation in twisted bilayer graphene
Phys. Rev. B **98**, 235158 (2018)
The discovery of superconductivity and Mott insulation in twisted bilayer graphene has inspired this work, where we show that the correlated insulator state stems from a macroscopic charge transfer between AA and AB regions of the Moiré unit cell. We were the first to point out the importance of real-space charge transfer. Cited 68 times.
4. R.-J. Slager, L. Rademaker, J. Zaanen and L. Balents,
Impurity Bound States and Greens Function Zeroes as Local Signatures of Topology
Phys. Rev. B **92**, 085126 (2015)
The classification of topological phases of matter is of utmost importance in modern condensed matter physics. We provide a simple yet effective way of observing topology by means of the experimentally accessible local tunneling spectrum. Cited 90 times.
5. S. Mahmoudian, L. Rademaker, A. Ralko, S. Fratini and V. Dobrosavljevic,
Glassy dynamics in geometrically frustrated Coulomb liquids without disorder
Phys. Rev. Lett. **115**, 025701 (2015)
Our theory has been experimentally confirmed in new experiments on organic electron glasses, and provides a new benchmark for glassy theories. At the moment, this work provides the dominant explanation for glassiness in the theta-organics. Cited 55 times.