

DANIELE GUERCI

Assistant Professor, William & Mary

CONTACT:

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EDUCATION:

Roma Tre University, Physics, BS 2013
Roma Tre University, Theoretical Physics, MS 2015
International School for Advanced Studies (SISSA), Condensed Matter, MPhil 2016
International School for Advanced Studies (SISSA), Condensed Matter (Fabrizio&Capone), Phd 2019

PROFESSIONAL EXPERIENCE:

Researcher, **Université Paris Diderot**, Paris (France) Jan 2020 - Jul 2021
Flatiron Research Fellow, **Flatiron Institute**, New York (USA) Sep 2021 - Oct 2024
Postdoctoral Researcher, **MIT**, Boston (USA) Nov 2024 - Aug 2026
Assistant Professor, **William & Mary**, Williamsburg (USA) Aug 2026 - Now

HONOR AND AWARDS:

Short Term Mobility Fellowship, CNR (Consiglio Nazionale delle Ricerche) (3500€), **La Sapienza** 2025
Flatiron Research Fellowship, **Flatiron Institute** 2021-2024
PhD Fellowship, **Roma Tre University** (declined), rated first in the admission test 2015
PhD Fellowship, **La Sapienza** (declined) 2015
“*Enrico Persico*” Fellowship for academic merit (6000€), **Accademia Nazionale dei Lincei** 2015
College Scholarship for academic merit (2000€), **Laziodisu** 2014
College Scholarship for academic merit (1000€), **Roma Tre University** 2013

INVITED WORKSHOPS AND PROGRAMS

- title: *Fractionalized Quantum States of Matter*, Santa Fe (USA), July 2026
- title: *Early Career Researchers on Flat Bands 2026*, Würzburg (GER), July 2026
- title: *Moiré Materials Magic Workshop*, Flatiron Institute, New York (USA), May 2025
- title: *Tunable Two-Dimensional Materials: Moiré and Beyond*, KITP, Santa Barbara (USA), Aug-Sept 2024
- title: *Novel Quantum States of Matter in Moiré Materials*, Aspen Center for Physics (USA), Mar 2023

INVITED TALKS

- **Invited Talk**, title: *Fractionalization and superconductivity in a flat Chern band*, workshop “Fractionalized Quantum States of Matter”, Santa Fe (USA), July 2026, <https://web.cvent.com/event/4bc28f47-b93e-4ae0-8a-624d6083-8575-45ae-8a1e-eb2cf3a9bc54>

- **Invited Talk**, title: *Fractionalization and superconductivity in a flat Chern band*, workshop “Early Career Researchers on Flat Bands 2026”, Würzburg (GER), July 2026, <https://ecrfb26.github.io/>
- **Invited Talk**, title: *Fractionalization and superconductivity in a flat Chern band*, University of Pisa, Pisa (Italy), April 2026
- **Invited Talk**, title: *Fractionalization and superconductivity in a Chern band*, March meeting, APS, Denver (USA), March 2026
- **Invited Talk**, title: *From Superconductivity to Fractionalization in Flat Chern Bands*, Flatiron Institute, New York (USA), March 2026
- **Colloquium**, title: *From Electron Pairing to Fractional Quantum Matter*, William & Mary, Williamsburg (USA), Feb 2026
- **Invited Talk**, title: *From electron pairs to fractions in van der Waals heterostructures*, Paul Scherrer Institute PSI, Villigen (Switzerland), Jan 2026
- **Colloquium**, title: *Quantum Materials for fault-tolerant Quantum Computation*, CNRS, Paris (France), Oct 2025
- **Invited Talk**, title: *Fractionalization and Superconductivity in flat Chern bands*, Università La Sapienza, Roma (Italy), Jul 2025
- **Plenary Talk**, title: *The Moiré the Merrier: Exploring Emergent Phases of Light and Matter*, Max Planck Research Group Leader Symposium, Berlin (Germany), Mar 2025
- **Colloquium**, title: *Exploring Superconductivity and Topological Heavy Fermions in Moiré Semiconductors*, University of Tennessee, Knoxville (USA), Feb 2025
- **Invited talk**, title: *Topological superconductivity from repulsive interactions in twisted WSe₂*, KITP, Santa Barbara (USA), Sep 2024, url:<https://online.kitp.ucsb.edu/online/moire24/guerci/>
- **Invited talk**, title: *Heavy fermions, superconductivity and magnetism in transition metal dichalcogenides*, UPenn, Philadelphia (USA), May 2024
- **Seminar**, title: *Correlated and topological phases of light and matter*, CNRS Institut Henri Poincaré, Paris (France), May 2024
- **Colloquium**, title: *Moiré quantum matter: where correlation meets topology*, CCQ, Flatiron Institute, New York (USA), Apr 2024
- **Seminar**, title: *Correlated and topological phases of light and matter*, CNRS Campus Pierre et Marie Curie, Paris (France), Apr 2024
- **Invited talk**, title: *Chiral Kondo lattices in bilayer transition metal dichalcogenides heterostructures*, Classical, Quantum and Active Fluids, CUNY, New York (USA), Mar 2024
- **Invited talk**, title: *Meron and Chiral Kondo lattices in topological insulators and heterostructures*, March meeting, APS, Minneapolis (USA), Mar 2024
- **Colloquium**, title: *Moiré quantum matter: where correlation meets topology*, University of Minnesota, Minneapolis (USA), Feb 2024
- **Colloquium**, title: *Moiré quantum matter: where correlation meets topology*, University of Texas Austin, Austin (USA), Feb 2024
- **Invited talk**, title: *Helical trilayer graphene and superconductivity in heterobilayer TMDs*, Twistronics and Moiré Materials: Bridging Theory and Experiments, ICTP, Trieste (Italy), Jan 2024, <https://indico.ictp.it/event/10456>

- **Invited talk**, title: *Correlated and topological phenomena in moiré quantum matter*, Condensed Matter theory seminar, Laboratoire de Physique des Solides, Orsay (France), Jan 2024
- **Invited talk**, title: *Correlated and topological phenomena in moiré quantum matter*, Condensed Matter theory seminar, ENS, Lyon (France), Jan 2024
- **Invited talk**, title: *Helical trilayer graphene and superconductivity in heterobilayer TMDs*, CIFAR meeting, Flatiron Institute, New York (USA), Nov 2023, <https://www.simonsfoundation.org/event/cifar-2023/2023-11-08/>
- **Invited talk**, title: *Interplay of two moiré patterns: TBG on hBN and Helical Trilayer Graphene*, Condensed Matter Seminar, Stony Brook University, Stony Brook (USA), Nov 2023
- **Invited talk**, title: *Interplay of two moiré patterns: TBG on hBN and Helical Trilayer Graphene*, The Mathematics and Physics of Moire Superlattices, BIRS, Banff (Canada), Oct 2023, <https://www.birs.ca/events/2023/5-day-workshops/23w5058/videos/watch/202310261507-Guerchi.html>
- **Invited talk**, title: *Interplay of two moiré patterns: TBG on hBN and Helical Trilayer Graphene*, CMT seminar, Rutgers University, New Brunswick (USA), Oct 2023
- **Invited talk**, title: *Chern Mosaic and ideal flat bands in twisted trilayer graphene*, CMSA seminar, Harvard University, Boston (USA), Oct 2023, url:<https://www.math.harvard.edu/event/cmsa-active-matter-interaction>
- **Invited talk**, title: *Chern Mosaic and ideal flat bands in twisted trilayer graphene*, MRSEC retreat, Columbia University, New York (USA), Sep 2023
- **Invited talk**, title: *Chern Mosaic and ideal flat bands in twisted trilayer graphene*, pro-qm seminar, Columbia University, New York (USA), Aug 2023
- **Invited talk**, title: *Helical trilayer graphene and superlattice induced ordering on the surface of a topological insulator*, symposium on moiré materials, Flatiron Institute, New York (USA), Aug 2023
- **Invited talk**, title: *Heavy fermions and superconductivity in heterobilayer transition metal dichalcogenides*, Berkley University, Berkley (USA), Aug 2023
- **Invited talk**, title: *Heavy fermions and superconductivity in heterobilayer transition metal dichalcogenides*, Stanford University, Stanford (USA), Aug 2023, url:<https://glam.stanford.edu/events/glam-special-seminar-heavy-fermions-and-superconductivity-heterobilayer-tmds>
- **Invited talk**, title: *Chern Mosaic and ideal flat bands in twisted trilayer graphene*, moiré materials workshop, Flatiron Institute, New York (USA), May 2023
- **Invited talk**, title: *Heavy fermions and superconductivity in heterobilayer transition metal dichalcogenides*, Università La Sapienza, Roma (Italy), Apr 2023
- **Invited talk**, title: *Heavy fermions and superconductivity in heterobilayer transition metal dichalcogenides*, Novel States of Quantum Matter in moiré Materials, Aspen (USA), Mar 2023
- **Invited talk**, title: *A moiré superlattice on the surface of a topological insulator*, M2S Conference, Vancouver (CA), Jul 2022
- **Invited talk**, title: *Superradiant phase transition in electronic systems and emergent topological phases*, Università della Calabria, Cosenza (Italy), Apr 2021
- **Invited talk**, title: *Superradiant phase transition in electronic systems and emergent topological phases*, College de France, Paris (France), Nov 2020
- **Invited talk**, title: *Unbinding slave spins in the Anderson impurity model*, Laboratoire de Physique des Solides, Orsay (France), Feb 2020

PROFESSIONAL ACTIVITIES/SCIENTIFIC LEADERSHIP:

- Organizer of the moiré meeting at CCQ, Flatiron Institute *Fall 2022- Spring 2024*
- PhD student representative at the International School for Advanced Studies (SISSA) *2016-2019*
- Speaker and Technical Support for SISSA Open Day *2017-2019*
- Referee for Nature Physics, Nature Communication, Nature Communication Physics, Proceedings of the National Academy of Sciences, Physical Review B and Physical Review Letters

LIST OF PUBLICATIONS

Daniele Guerci

Assistant Professor, William & Mary

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1. *Spin polarization induced by an electric field in the presence of weak localization effects*, Daniele Guerci, Juan Borge, Roberto Raimondi, *Physica E* **75**, 370 (2016)
 2. Reprint of: *Spin polarization induced by an electric field in the presence of weak localization effects*, Daniele Guerci, Juan Borge, Roberto Raimondi, *Physica E* **82**, 151 (2016). Special issue *Frontiers in quantum electronic transport in memory of Markus Büttiker*
 3. *Unbinding slave spins in the Anderson impurity model*, Daniele Guerci and Michele Fabrizio, *Physical Review B* **96**, 201106(R) (2017)
 4. *Pauli metallic ground state in Hubbard clusters with Rashba spin-orbit coupling*, Valentina Brosco, Daniele Guerci, Massimo Capone, *Physical Review B* **97**, 125103 (2018)
 5. *Exciton Mott transition revisited*, Daniele Guerci, Massimo Capone, Michele Fabrizio, *Physical Review Materials* **3**, 054605 (2019)
 6. *Transport through a magnetic impurity: a slave spin approach*, Daniele Guerci, *Physical Review B* **99**, 195409 (2019)
 7. *Probing Majorana edge states by measuring transport through an interacting magnetic impurity*, Daniele Guerci, Andrea Nava, *Physica E* **134**, 114895 (2021)
 8. *Superradiant phase transition in electronic systems and emergent topological phases*, Daniele Guerci, Pascal Simon, Christophe Mora, *Physical Review Letters* **125** (25), 257604 (2021)
 9. *Moiré lattice effects on the orbital magnetic response of twisted bilayer graphene and Condon instability*, Daniele Guerci, Pascal Simon, Christophe Mora, *Physical Review B* **103** (224436), 17 (2021)
 10. *Higher-order van Hove singularity in magic-angle twisted trilayer graphene*, Daniele Guerci, Pascal Simon, Christophe Mora, *Physical Review Research* **4** (1), L012013 (2022)
 11. *Designer meron lattice on the surface of a topological insulator*, Daniele Guerci, Jie Wang, J. H. Pixely, Jen Cano, *Physical Review B* **106**, 245417 (2022)
 12. *Chiral Kondo lattice in doped $\text{MoTe}_2/\text{WSe}_2$ bilayers*, Daniele Guerci, Jie Wang, Jiawei Zhang, Jen Cano, J. H. Pixely, Andrew Millis, *Science Advances* **9**, (11) (2023)
 13. *Supermoiré low-energy effective theory of twisted trilayer graphene*, Yuncheng Mao, Daniele Guerci, Christophe Mora, *Physical Review B* **107**, 125423 (2023) [**Editors' Suggestion**]
 14. *The time dependent ghost-Gutzwiller dynamics*, Daniele Guerci, Massimo Capone, Nicola Lanatá, *Physical Review Research* **5**, L032023 (2023)
 15. *Topological superconductivity in doped magnetic insulators of moiré semiconductors*, Valentin Crépel*, Daniele Guerci*, Jen Cano, J. H. Pixley, Andrew Millis, *Physical Review Letters*, **131**, 056001 (2023) [**Editors' Suggestion**] (* **equally contributing coauthors**)

16. *Chern mosaic and ideal flat bands in equal-twist trilayer graphene*, Daniele Guerzi, Yuncheng Mao, Christophe Mora, Physical Review Research **6**, L022025 (2024)
17. *Chiral model of twisted bilayer graphene realized in a monolayer*, Valentin Crépel, Aaron Dunbrack, Daniele Guerzi, John Bonini, Jennifer Cano, Physical Review B **108**, 075126 (2023)
18. *Geometric Stiffness in Interlayer Exciton Condensates*, Nishchhal Verma*, Daniele Guerzi*, Raquel Queiroz, Physical Review Letters, **132**, 236001 (2024) (* **equally contributing coauthors**)
19. *Nature of even and odd magic angles in helical twisted trilayer graphene*, Daniele Guerzi, Yuncheng Mao, Christophe Mora, Physical Review B **109**, 205411 (2024)
20. *Imaging Superstructure Self-Alignment Among Twisted Atomic Layers*, Xinyuan Lai, Daniele Guerzi, Guohong Li, Kenji Watanabe, Takashi Taniguchi, Justin Wilson, J. H. Pixley, Eva Y. Andrei, arXiv:2311.07819 (2023)
21. *Edge zeros and boundary spinons in topological Mott insulators*, Niklas Wagner*, Daniele Guerzi*, Andrew Millis, Giorgio Sangiovanni, Physical Review Letters **133**, 126504 (2024) (* **equally contributing coauthors**)
22. *Absence of quantization in the circular photogalvanic effect in disordered chiral Weyl semimetals*, Ang-Kun Wu, Daniele Guerzi, Yixing Fu, Justin Wilson, J. H. Pixley, Physical Review B **110** (1), 014201 (2024)
23. *Sublattice structure and topology in spontaneously crystallized electronic states*, Yongxin Zeng, Daniele Guerzi, Valentin Crépel, Andrew Millis, Jen Cano, Physical Review Letters **132** (23), 236601 (2024) [**Editors' Suggestion**]
24. *Helical trilayer graphene in magnetic field: Chern mosaic and higher Chern number ideal flat bands*, Anushree Datta, Daniele Guerzi, Mark Goerbig, Christophe Mora, Physical Review B **110**, 075417 (2024) [**Editors' Suggestion**]
25. *Electrical Transport in the Hatsugai-Kohmoto Model*, Daniele Guerzi, Giorgio Sangiovanni, Andrew Millis and Michele Fabrizio, Physical Review B **111**, 075124 (2025) [**Editors' Suggestion**]
26. *Topological Kondo semimetal and insulator in AB-stacked heterobilayer transition metal dichalcogenides*, Daniele Guerzi, Kevin P. Lucht, Valentin Crépel, Jennifer Cano, J. H. Pixley, Andrew Millis, Physical Review B **110**, 165128 (2024) [**Editors' Suggestion**]
27. *Layer skyrmions for ideal Chern bands and twisted bilayer graphene*, Daniele Guerzi, Jie Wang, Christophe Mora, Physical Review B **112**, L041108 (2024)
28. *Topological superconductivity from repulsive interactions in twisted WSe₂*, Daniele Guerzi, Daniel Kaplan, Julian Ingham, J.H. Pixley, Andrew Millis, arXiv:2408.16075 (2024)
29. *Charge transfer spin-polarons and ferromagnetism in weakly doped AB-stacked TMD heterobilayers*, Daniele Guerzi, J.H. Pixley, Andrew Millis, arXiv:2411.05908 (2024)
30. *Ferromagnetic superconductivity with excitonic Cooper pairs: Application to Γ -valley twisted semiconductors*, Daniele Guerzi, Liang Fu, Science Advances **12**, (21) eaeb4888 (2026)
31. *Spontaneous vortex-antivortex lattice and Majorana fermions in rhombohedral graphene*, Filippo Gaggioli, Daniele Guerzi, Liang Fu, Physical Review Letters **135**, 116001 (2025)
32. *Topologically enabled superconductivity: possible implications for rhombohedral graphene*, Francesca Paoletti,

Daniele Guerci, Giorgio Sangiovanni, Urban FP Seifert, Elio J König, arXiv:2504.13166 (2025)

33. *From Fractionalization to Chiral Topological Superconductivity in Flat Chern Band*, Daniele Guerci, Ahmed Abouelkomsan, Liang Fu, Physical Review Letters **135**, 186601 (2025) [**Editors' Suggestion**]

34. *Higher Chern bands in helical homotrilayer transition metal dichalcogenides*, Jungho Daniel Choi, Nicolás Morales-Durán, Yves H. Kwan, Andrew Millis, Nicolas Regnault, Daniele Guerci, Physical Review B **112**, 205122 (2025) [**Editors' Suggestion**]

35. *Anomalous Hall effect in rhombohedral graphene*, Vera Mikheeva, Daniele Guerci, Daniel Kaplan, Elio J König, Physical Review B **113**, 125407 (2026)

36. *Attention-Based Foundation Model for Quantum States*, Timothy Zaklama, Daniele Guerci, Liang Fu, arXiv:2512.11962 (2025)

37. *Topological superconductivity with emergent vortex lattice in twisted semiconductors*, Daniele Guerci, Ahmed Abouelkomsan, Liang Fu, arXiv:2602.15106 (2026)

38. *Topological Kondo Insulator from Spin Loop Currents*, Andreas Gleis, Kevin Lucht, Po-Jui Chen, Daniele Guerci, Andrew J Millis, J.H. Pixley, arXiv:2604.11739 (2026)