Mme Karyn LE HUR: Publications

*142 Articles including 12 Reviews (introduced here with * in publications list), 2 books' chapters*
https://scholar.google.com/citations?user=9LsrbzAAAAAJhl=en

Participation in Books

Participation in a Popular Book on Quantum Mechanics, Le Plus Grand des Hasards, Editors Jean-Francois Dars and Anne-Marie Papillaut, 2010, 65 authors

Book on *Understanding Quantum Phase Transitions*, editor L. D. Carr
Taylor and Francis, Boca Raton, 2010
Chapter on *Quantum Phase Transitions in Spin-Boson Systems: Dissipation and Light phenomena*, by Karyn Le Hur (26 pages, also accessible at arXiv:09094822)

Reviews

1. *Topological Matter and Fractional Entangled Geometry*,
Karyn Le Hur, arXiv:2209.15381, 108 pages, submitted to Physics Reports, October 2023.
Review March 2024 received suggesting to shorten the Review.
Published Shortened Version: *Interacting Topological Aspects with Light and Geometrical Functions*, Physics Reports 1104 1-42 (2025). Presentation (1h23) accessible online
The published Review follows four courses that I gave at Paris-Saclay Lectures Series 2023 on Geometry in the Quantum. Slides are accessible on my web page.

2. *Phase-Coherent Dynamics of Quantum Devices With Local Interactions*,
Michele Filippone, Arthur Marguerite, Karyn Le Hur, Gwendal Fève, Christophe Mora,
Entropy 2020, **22**(8), 847

3. *Driven dissipative dynamics and topology of quantum impurity systems*,
Karyn Le Hur, Loïc Henriet, Loïc Herviou, Kirill Plekhanov, Alexandru Petrescu, Tal Goren, Marco Schiro, Christophe Mora, Peter P. Orth, arXiv:1702.05135
Comptes Rendus Académie des Sciences, Special Issue on Quantum Simulators, **19**, 451-483 (2018).

4. *Many-Body Quantum Electrodynamics Networks: Non-Equilibrium Condensed Matter Physics with Light*, Karyn Le Hur, Loïc Henriet, Alexandru Petrescu, Kirill Plekhanov, Guillaume Roux, Marco Schiró, arXiv:1505.00167, C. R. Physique **17** (2016) 808-835.

5. *Fluctuations and Entanglement spectrum in quantum Hall states*,
Alexandru Petrescu, H. Francis Song, Stephan Rachel, Zoran Ristivojevic, Christian Flindt, Nicolas Laflorencie, Israel Klich, Nicolas Regnault, Karyn Le Hur J. Stat. Mech. (2014) P10005.

6. *Correlated Topological Phases and Exotic Magnetism with Ultracold Fermions*
Peter P. Orth, Daniel Cocks, Stephan Rachel, Michael Buchhold, Karyn Le Hur, Walter Hofstetter, arXiv:1212.5607
Contribution to J. Phys. B special issue on non-Abelian gauge fields, J. Phys. B: At. Mol. Opt. Phys. **46** (2013) 134004. and D. Cocks *et al.* Phys. Rev. Lett. **109**, 205303 (2012).

7. *Non-perturbative stochastic method for driven spin-boson model*
Peter P. Orth, Adilet Imambekov, Karyn Le Hur Phys. Rev. B **87**, 014305 (2013).

See also Loïc Henriet, Zoran Ristivojevic, Peter P. Orth, Karyn Le Hur, Phys. Rev. A **90**, 023820 (2014).

8. *Bipartite Fluctuations as a Probe of Many-Body Entanglement*
H. Francis Song, Stephan Rachel, Christian Flindt, Israel Klich, Nicolas Laflorencie, Karyn Le Hur, arXiv:1109.1001, 30 pages+25 pages Supplementary Material
Phys. Rev. B **85**, 035409 (2012), Editors' Suggestion.

9. Survey on *Effective Equilibrium Theory in NonEquilibrium Quantum Transport*, by Prasenjit Dutt, Jens Koch, J. Han and Karyn Le Hur, arXiv:1101.1526, 53 pages
Annals of Physics **326**, (2011) 2963-2999

10. *Superconductivity close to the Mott state: From condensed-matter systems to Superfluidity in optical lattices*, K. Le Hur and T. Maurice Rice, review article,
Annals of Physics **324**, 1452-1515 (2009), Special Issue July, arXiv:0812.1581, 98 pages

11. *Entanglement Entropy, decoherence, quantum phase transition of a dissipative two-level system*, Karyn Le Hur, Annals of Physics **323**, 2208-2240 (2008) (34 pages).

12. *Review Article on heavy fermions initiated by B. Coqblin:*
B. Coqblin, J. Arispe, J. R. Iglesias, C. Lacroix, and Karyn Le Hur, J. Phys. Soc. Jpn. **65**, 64 (1996).

List of Publications

Publications 2024
142 *Topological p-wave Superconductors with Disorder and Interactions*
Frederick del Pozo, Löic Herviou, Olesia Dmytruk, Karyn Le Hur, arXiv:2408.02105 (positive reports from PRB)
141 *Spectroscopy and topological properties of a Haldane light system*
Julian Legendre and Karyn Le Hur, Phys. Rev. A **109** L 021701 (2024)
140 * *Topological Matter and Fractional Entangled Geometry*,
Karyn Le Hur, arXiv:2209.15381, submitted to Physics Reports October 2023, 108 pages. Shortened Version accepted: Interacting Topological Aspects with Light and Geometrical Functions,
Physics Reports 1104 (2025) 1-42, golden open access; Presentation accessible online on Cassiny (1h23).
139 *Quantum Hall and Light Response in a 2D topological semimetal*
Karyn Le Hur and Sariah Al Saati, arXiv:2311.13922. Comptes Rendus Académie des Sciences, in press.
138 *Topological signatures of a p-wave superconducting wire through Light*
Frederick del Pozo and Karyn Le Hur, arXiv:2401.14501, Phys. Rev. B 110, L060503 (2024).
137 *Majorana fermions and quantum information with fractional topology and disorder*
Ephraim Bernhardt, Brian Chung Hang Cheung, Karyn Le Hur, Phys. Rev. Research 6, 023221 (2024).

Publications 2023
136 *One-Half Topological Numbers in Entangled Quantum Physics*
Karyn Le Hur, Phys. Rev. B **108**, 235144 (2023).
135 *Protected Topological Nodal Ring Semimetal in Graphene*

Karyn Le Hur and Sariah Al Saati, Phys. Rev. B **107**, 165407 (2023).
134 *Fractional Topology in interacting 1D Superconductors*,
Frederick del Pozo, Loïc Herviou, Karyn Le Hur, arXiv:2210.05024, 32 pages, Phys. Rev. B **107**, 155134 (2023).
133 *A topologically protected quantum dynamo effect in a driven spin-boson model*,
Ephraim Bernhardt, Cyril Elouard, Karyn Le Hur, arXiv:2208.01707, 27 pages, published in Phys. Rev. A **107**, 022219 (2023).

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131 *Global and Local Topological Quantized Responses from Geometry, Light and Time*,
Karyn Le Hur, Phys. Rev. B **105**, 125106 (2022).
130 *Doping a topological insulator: a promising strategy to find topological superconductors?*
Sebastian Wolf, Tyler Gardener, Karyn Le Hur, Stephan Rachel, Phys. Rev. B **105**, L100505 (2022).

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128 *Interacting Stochastic Topology and Mott Transition from Light Response*,
Philipp W. Klein, Adolfo G. Grushin, Karyn Le Hur, Phys. Rev. B **103**, 035114 (2021)
127 *Quantum Entangled Fractional Topology and Curvatures*,
Joel Hutchinson, Karyn Le Hur, Communication Physics **4**, 144 (2021).
126 *Quantum system dynamics with a weakly nonlinear Josephson junction bath*,
Jing Yang, Étienne Jussiau, Cyril Elouard, Karyn Le Hur, Andrew N. Jordan
Phys. Rev. B **103**, 085402 (2021)
125 *Localization Dynamics from Static and Mobile Impurities*,
Ephraim Bernhardt, Fan Yang, Karyn Le Hur, Phys. Rev. B **104**, 115113 (2021)
124 *Spin-orbit coupling in the kagome lattice with flux and time-reversal symmetry*,
Irakli Titvinidze, Julian Legendre, Maarten Grothus, Bernhard Irsigler, Karyn Le Hur, Walter Hofstetter, Phys. Rev. B **103**, 195105 (2021)
123 *Analytical approach for the Mott transition in the Kane-Mele-Hubbard model*,
Joel Hutchinson, Philipp W. Klein, Karyn Le Hur, Phys. Rev. B **104**, 075120 (2021)

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122* *Phase-Coherent Dynamics of Quantum Devices With Local Interactions*,
Michele Filippone, Arthur Marguerite, Karyn Le Hur, Gwendal Fève, Christophe Mora
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121 *Valence bond fluctuations in the Kitaev spin model*,
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120 *Magnetic Topological Kagome Systems*,
Julian Legendre and Karyn Le Hur, Phys. Rev. Research **2**, 022043 (2020)
119 *From Topological Superconductivity to Quantum Hall States in Coupled Wires*,
Fan Yang, Vivien Perrin, Alexandru Petrescu, Ion Garate, Karyn Le Hur, Phys. Rev. B **101**, 085116 (2020)

118 *Fluctuating Forces Induced by Non Equilibrium and Coherent Light Flow*,
Ariane Soret, Karyn Le Hur, Eric Akkermans, Phys. Rev. Lett. **124**, 136803 (2020)

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117 *Topological proximity effects in a Haldane-graphene bilayer system*,
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116 *Mechanical resonances of mobile impurities in a one-dimensional quantum fluid*,
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115 *Real-Time Ramsey Interferometry in Fractional Quantum Hall States*,
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Andrea Pizzi, Fabrizio Dolcini, Karyn Le Hur, arXiv:1810.12414
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113 *Bipartite Fluctuations and Topology of Dirac and Weyl Systems*,
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112 *Engineering Quantum Spin Liquids and Many-Body Majorana States with a Driven Superconducting Box Circuit*,
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111 *Emergent Chiral Spin State in the Mott Phase of a Bosonic Kane-Mele-Hubbard Model*, Kirill Plekhanov, Ivana Vasic, Alexandru Petrescu, Rajbir Nirwan, Guillaume Roux, Walter Hofstetter, Karyn Le Hur, Phys. Rev. Lett. **120**, 157201 (2018).
110* *Driven dissipative dynamics and topology of quantum impurity systems* Karyn Le Hur, Loïc Henriet, Loïc Herviou, Kirill Plekhanov, Alexandru Petrescu, Tal Goren, Marco Schiro, Christophe Mora, Peter P. Orth, 39 pages, arXiv:1702.05135,
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109 *Topological Zak Phase in Strongly-Coupled LC Circuits*
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108 *Ramsey Interferometry of Particle-Hole Pairs in Tunnel Junctions*
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107 *Majorana Spin Liquids, Topology and Superconductivity in Ladders*
Karyn Le Hur, Ariane Soret, Fan Yang, Phys. Rev. B **96**, 205109 (2017).
106 *Bipartite charge fluctuations in one-dimensional $\mathcal{Z}_2$ superconductors and insulators*
Loic Herviou, Christophe Mora, Karyn Le Hur, Phys. Rev. B **96**, 121113 (2017).
105 *Precursor of Laughlin state of hard core bosons on a two leg ladder* Alexandru Petrescu, Marie Piraud, Guillaume Roux, I. P. McCulloch, Karyn Le Hur, Phys. Rev. B **96**, 014524 (2017).
104 *Topology of a dissipative spin: dynamical Chern number, bath induced non-adiabaticity and a quantum dynamo effect* Loïc Henriet, Antonio Sclocchi, Peter P. Orth, Karyn Le Hur, Phys. Rev. B **95**, 054307 (2017).
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Loïc Herviou, Karyn Le Hur, Christophe Mora Phys. Rev. B **94**, 235102 (2016).
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100* *Many-Body Quantum Electrodynamics Networks: Non-Equilibrium Condensed Matter Physics with Light*, Karyn Le Hur, Loïc Henriet, Alexandru Petrescu, Kirill Plekhanov, Guillaume Roux, Marco Schiró, arXiv:1505.00167, C. R. Physique **17** (2016) 808-835.
99 Realizing Topological Mott Insulators from the RKKY Interaction,
Tianhan Liu, Benoît Douçot, Karyn Le Hur Phys. Rev. B **93**, 195153 (2016).
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Loïc Herviou, Christophe Mora, Karyn Le Hur, Phys. Rev. B **93**, 165142 (2016), 24 pages.
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94 Electrical Current from Quantum Vacuum Fluctuations in Nano-engines
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93 Topological Superconductivity in Two Dimensions with Mixed Chirality
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92 Chiral Mott Insulators, Meissner Effect, and Laughlin States in Quantum Ladders
Alexandru Petrescu, Karyn Le Hur, Phys. Rev. B **91**, 054520 (2015).
91 *Chiral Bosonic Phases on the Haldane Honeycomb Lattice*,
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89* *Fluctuations and Entanglement spectrum in quantum Hall states* ,
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87 *Tunable Hybrid Quantum Electrodynamics from Non-Linear Electron Transport*,
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84 *Bosonic Mott Insulator with Meissner Currents*,
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83 *Admittance of the SU(2) and SU(4) Anderson quantum RC circuits*,
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82 *Strongly correlated dynamics in multichannel quantum RC circuits*,
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Wei Wu, Michael M. Scherer, Carsten Honerkamp, Karyn Le Hur, Phys. Rev. B **87**, 094521 (2013) [12 pages]
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73 *Quantum Spin Hall Insulators with Interactions and Lattice Anisotropy*, Wei Wu, Stephan Rachel, Wu-Ming Liu and Karyn Le Hur, arXiv:1106.0943 and published Phys. Rev. B **85**, 205102 (2012).
72 *Anomalous Hall Effects of Light and Chiral Edge Modes on the Kagome Lattice*
Alexandru Petrescu, Andrew Houck, Karyn Le Hur, Phys. Rev. A **86**, 053804 (2012).
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70 *Detecting Quantum Critical Points using Bipartite Fluctuations*, Stephan Rachel, Nicolas Laflorencie, H. Francis Song, Karyn Le Hur, Phys. Rev. Lett. **108**, 116401 (2012)
69 *Heisenberg Uncertainty Principle as a Probe of Entanglement Entropy: Application to Superradiant Quantum Phase Transitions* Pierre Nataf, Mehmet Dogan, Karyn Le Hur Phys. Rev. A **86**, 043807 (2012)
68 *Noninvasive Probes of Charge Fractionalization in Quantum Spin-Hall Insulators*, Ion Garate and Karyn Le Hur, Phys. Rev. B **85**, 195465 (2012)
67 *d-wave superfluid with Gapless Edges in a Cold Atom Trap*, Anne-Louise Gadsbolle, H. Francis Song, Karyn Le Hur, Phys. Rev. A **85**, 051603(R) (2012).

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65 *Giant Charge Relaxation Resistance in the Anderson Model*, Michele Filippone, Karyn Le Hur and Christophe Mora, Phys. Rev. Lett. **107**, 176601 (2011).
64 *Entanglement Entropy of the Two-Dimensional Heisenberg Antiferromagnet*, H. Francis Song, Nicolas Laflorencie, Stephan Rachel, Karyn Le Hur, Phys. Rev. B **83**, 224410 (2011).
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60 *Time-reversal symmetry breaking in circuit-QED based photon lattices*, Jens Koch, Andrew Houck, Karyn Le Hur and S. M. Girvin, Phys. Rev. A **82**, 043811 (2010).
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58 *Topological Insulators and Mott physics from the Hubbard Interaction*, Stephan Rachel and Karyn Le Hur, Phys. Rev. B **82**, 075106 (2010).
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56 *General Relation between Entanglement and Fluctuations in One Dimension*, Francis Song, Stephan Rachel and Karyn Le Hur, Phys. Rev. B **82**, 012405 (2010).
55 *Universal Resistances of the Quantum RC circuit*, Christophe Mora and Karyn Le Hur,
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54 *Universality in dissipative Landau-Zener transitions*, Peter P. Orth, Adilet Imambekov and Karyn Le Hur, Phys. Rev. A **82**, 032118 (2010).
53 *Electric field Tuned Dimensional Crossover in Ar-Irradiated $SrTiO_3$*, J. H. Ngai, Y. Segal, F. J. Walker, S. Ismail-Beigi, K. Le Hur and C. H. Ahn, Phys. Rev. B **81**, 241307(R) (2010).

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