

Mme Karyn LE HUR: Publications

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

7623 citations; H-index 49; 2206 citations since 2021 (February 2026).

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.
 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 Henriët, 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 Henriët, 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 Henriët, 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 2025

148 Spin Response of a Magnetic Monopole and Quantum Hall Response in Topological Lattice Models through Local Invariants and Light

Karyn Le Hur, Andrea Baldanza, arXiv:2512.19511

147 *Theory of local orbital magnetization: local Berry curvature*

Sariah Al Saati, Karyn Le Hur, Frédéric Piéchon, arXiv:2512.12543

146 *Free Majorana Modes in Superconducting Quantum Wires*

Karyn Le Hur, arXiv:2511.03380.

145 *Topological Signatures of Magnetic Phase Transitions with Majorana Fermions through Local Observables and Quantum Information*

Karyn Le Hur, Fan Yang, Magali Korolev, arXiv:2506.11731, accepted for Publication in Phys. Rev. B as a Letter (February 2026).

144 *Bipartite Fluctuations and Charge Fractionalization in Quantum Wires*

Magali Korolev, Karyn Le Hur, arXiv:2501.14410, accepted for Publication in Phys. Rev. B (January 2026).

143 *Topological Quantum Spin Hall Semimetals with Light*

Karyn Le Hur, arXiv:2412.07304, Phys. Rev. B **112**, 075120 (2025)

142 *Topological p-wave Superconductors with Disorder and Interactions*

Frederick del Pozo, Loïc Herviou, Olesia Dmytruk, Karyn Le Hur, Phys. Rev. B **111**, 075170 (2025).

Publications 2024

141 *Spectroscopy and topological properties of a Haldane light system*

Julian Legendre and Karyn Le Hur, Phys. Rev. A **109** L 021701 (2024)

140 * Review: 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, Comptes Rendus Académie des Sciences, Comptes Rendus. Physique, Volume **25** (2024), pp. 415-432.

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).

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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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132 *Hubbard model on the Kagome lattice with time-reversal invariant flux and spin-orbit coupling,* Irakli Titvindze, Julian Legendre, Karyn Le Hur, Walter Hofstetter, Phys. Rev. B **105**, 235102 (2022).

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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129 *Kondo induced π -phase shift of microwave photons in a circuit quantum electrodynamics architecture,* Guang-Wei Deng, Loic Henriët, Da Wei, Shu-Xiao Li, Hai-Ou Li, Gang Cao, Ming Xiao, Guang-Can Guo, Marco Schiro, Karyn Le Hur, Guo-Ping Guo, Phys. Rev. B **104**, 125407 (2021)

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 Grothuis, 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
Entropy 2020, **22**(8), 847

121 *Valence bond fluctuations in the Kitaev spin model*,
Fan Yang, Kirill Plekhanov, Karyn Le Hur, Phys. Rev. Research **2**, 013005 (2020)

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*,
Peng Cheng, Philipp W. Klein, Kirill Plekhanov, Klaus Sengstock, Monika Aidelsburger, Christof Weitenberg, Karyn Le Hur, Phys. Rev. B(R) **100**, 081107 (2019)

116 *Mechanical resonances of mobile impurities in a one-dimensional quantum fluid*,
Thomas L. Schmidt, Giacomo Dolcetto, Christopher J. Pedder, Karyn Le Hur, Peter P. Orth, Phys. Rev. Lett. **123**, 075302 (2019).

115 *Real-Time Ramsey Interferometry in Fractional Quantum Hall States*,
Tal Goren and Karyn Le Hur, Phys. Rev. B(R) **99**, 161109 (2019) (2019).

114 *Quench-induced dynamical phase transitions and π -synchronization in the Bose-Hubbard Model*,
Andrea Pizzi, Fabrizio Dolcini, Karyn Le Hur, arXiv:1810.12414
Phys. Rev. B **99**, 094301 (2019), 22 pages.

113 *Bipartite Fluctuations and Topology of Dirac and Weyl Systems*,
Loïc Herviou, Karyn Le Hur, Christophe Mora, Phys. Rev. B **99**, 075133 (2019).

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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 Henriët, Loïc Herviou, Kirill Plekhanov, Alexandru Petrescu, Tal Goren, Marco Schiro, Christophe Mora, Peter P. Orth, 39 pages, arXiv:1702.05135,
Comptes Rendus Académie des Sciences, Special Issue on Quantum Simulators, **19**, 451-483 (2018).

109 *Topological Zak Phase in Strongly-Coupled LC Circuits*

Tal Goren, Kirill Plekhanov, Félicien Appas, Karyn Le Hur, Phys. Rev. B **97**, 041106 (2018).

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 Z_2 superconductors and insulators*

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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 Henriët, Antonio Sclocchi, Peter P. Orth, Karyn Le Hur, Phys. Rev. B **95**, 054307 (2017).

103 *Floquet Engineering of Haldane Chern Insulators and Chiral bosonic phase transitions*, Kirill Plekhanov, Guillaume Roux, Karyn Le Hur Phys. Rev. B **95**, 045102 (2017).

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102 *Many-terminal Majorana island: from Topological to Multi-Channel Kondo Model*

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101 *Triplet FFLO Superconductivity in the doped Kitaev-Heisenberg Honeycomb Model*, Tianhan Liu, Cécile Repellin, Benoît Douçot, Nicolas Regnault, Karyn Le Hur, Phys. Rev. B **94**, 180506 (2016).

100* *Many-Body Quantum Electrodynamics Networks: Non-Equilibrium Condensed Matter Physics with Light*, Karyn Le Hur, Loïc Henriët, 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).

98 *Phase Diagram and Entanglement of two interacting topological Kitaev chains*

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97 *Entanglement structure of the two-channel Kondo model*

Bedoor Alkurtass, Abolfazl Bayat, Ian Affleck, Sougato Bose, Henrik Johannesson, Pasquale Sodano, Erik S. Sorensen, Karyn Le Hur, Phys. Rev. B **93**, 081106 (2016).

96 *Quantum sweeps, synchronization, and Kibble-Zurek physics in dissipative quantum spin systems*, Loïc Henriët, Karyn Le Hur, Phys. Rev. B **93**, 064411 (2016) (24 pages).

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95 *Condensed-matter physics: Quantum dots and the Kondo effect*,

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94 *Electrical Current from Quantum Vacuum Fluctuations in Nano-engines*

Loïc Henriët, Andrew N. Jordan, Karyn Le Hur, Phys. Rev. B **92**, 125306 (2015).

93 *Topological Superconductivity in Two Dimensions with Mixed Chirality*

A. M. Black-Schaffer, K. Le Hur, Phys. Rev. B **92**, 140503(R) (2015).

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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- 90** *Chiral d-wave superconductivity on the honeycomb lattice close to the Mott state*, Annica M. Black-Schaffer, Wei Wu, Karyn Le Hur, Phys. Rev. B **90**, 054521 (2014).
89* *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.
88 *Quantum Dynamics of the Driven and Dissipative Rabi Model*, Loïc Henriët, Zoran Ristivojevic, Peter P. Orth, Karyn Le Hur, Phys. Rev. A **90**, 023820 (2014).
87 *Tunable Hybrid Quantum Electrodynamics from Non-Linear Electron Transport*, Marco Schiró, Karyn Le Hur, Phys. Rev. B **89**, 195127 (2014).

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- 86** *Anisotropic Quantum Spin Hall Effect, Spin-Orbital Textures and Mott Transition*, Tianhan Liu, Benoît Douçot, Karyn Le Hur Phys. Rev. B **88**, 245119 (2013), 24 pages
85 *Strongly-Correlated Thermoelectric Transport beyond Linear Response*, Prasenjit Dutt and Karyn Le Hur Phys. Rev. B **88**, 235133 (2013).
84 *Bosonic Mott Insulator with Meissner Currents*, Alexandru Petrescu, Karyn Le Hur Phys. Rev. Lett. **111**, 150601 (2013).
83 *Admittance of the $SU(2)$ and $SU(4)$ Anderson quantum RC circuits*, Michele Filippone, Karyn Le Hur, Christophe Mora, Phys. Rev. B **88**, 045302 (2013).
82 *Strongly correlated dynamics in multichannel quantum RC circuits*, Prasenjit Dutt, Thomas Schmidt, Christophe Mora, Karyn Le Hur Phys. Rev. B **87**, 155134 (2013).
81 *Correlated Dirac particles and Superconductivity on the Honeycomb Lattice*, Wei Wu, Michael M. Scherer, Carsten Honerkamp, Karyn Le Hur, Phys. Rev. B **87**, 094521 (2013) [12 pages]
80* *Correlated Topological Phases and Exotic Magnetism with Ultracold Fermions*, Peter P. Orth, Daniel Cocks, Stephan Rachel, Michael Buchhold, Karyn Le Hur, Walter Hofstetter, J. Phys. B: At. Mol. Opt. Phys. **46** (2013) 134004 (topical review)
79 *Low Frequency Admittance as a Probe of Majorana Fermions*, Christophe Mora, Karyn Le Hur Phys. Rev. B **88**, 241302 (2013).
78 *Non-equilibrium Quantum Transport through a dissipative resonant level model*, Chung-Hou Chung, Karyn Le Hur, Gleb Finkelstein, Matthias Vojta, Peter Woelfle, Phys. Rev. B **87**, 245310 (2013).
77* *Non-perturbative stochastic method for driven spin-boson model*, Peter P. Orth, Adilet Imambekov, Karyn Le Hur Phys. Rev. B **87**, 014305 (2013).
76 *Scaling of Entanglement Entropy across Lifshitz transitions*, Marlon Rodney, H. Francis Song, Sung-Sik Lee, Karyn Le Hur, Erik Sorensen, Phys. Rev. B **87**, 115132 (2013).

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73 *Quantum Spin Hall Insulators with Interactions and Lattice Anisotropy*, Wei Wu, Stephan Rachel,

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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).
71 *Time-reversal invariant Hofstadter-Hubbard model with Ultracold Fermions*
 Daniel Cocks, Peter P. Orth, Stephan Rachel, Michael Buchhold, Karyn Le Hur, Walter Hofstetter,
 Phys. Rev. Lett. **109**, 205303 (2012)
70 *Detecting Quantum Critical Points using Bipartite Fluctuations*, Stephan Rachel, Nicolas Laflo-
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69 *Heisenberg Uncertainty Principle as a Probe of Entanglement Entropy: Application to Superra-
 diant Quantum Phase Transitions* Pierre Nataf, Mehmet Dogan, Karyn Le Hur Phys. Rev. A **86**,
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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 Gadsballe, H. Francis
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- 66*** *Effective Equilibrium Theory in NonEquilibrium Quantum Transport*, by Prasenjit Dutt, Jens
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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,
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63 *Entanglement from Charge Statistics: Exact Relations for Many-Body Systems*, H. Francis Song,
 Christian Flindt, Stephan Rachel, Israel Klich, Karyn Le Hur, Phys. Rev. B **83**, 161408(R) (2011).
62 *Designing Heterostructures with Higher Temperature Superconductivity*, Karyn Le Hur, Chung-
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61 *Effective Thermodynamics of a coupled Two-level system*, N. S. Williams, K. Le Hur and A.
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- 60** *Time-reversal symmetry breaking in circuit-QED based photon lattices*, Jens Koch, Andrew
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56 *General Relation between Entanglement and Fluctuations in One Dimension*, Francis Song,
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- 51** *Theory of non-equilibrium transport in the $SU(N)$ Kondo regime*, Christophe Mora, Pavel Vitushinsky, Xavier Leyronas, Aashish A. Clerk, Karyn Le Hur, arXiv:0906.2791, 17 pages. Phys. Rev. B **80**, 155322 (2009) (Editors' suggestion).
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- 49** *Supersolidity of Cold Atomic Bose-Fermi mixtures in optical lattices*, P. P. Orth, D. L. Bergman, and K. Le Hur, Phys. Rev. A **80**, 023624 (2009).
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- 47** *Non-equilibrium transport at a dissipative quantum phase transition*, Chung-Hou Chung, Karyn Le Hur, Matthias Vojta, Peter Wölfe, Phys. Rev. Lett. **102**, 216803 (2009).
- 46** *Entanglement, decoherence, and dynamics of a two-state system*, Karyn Le Hur Proceedings of PQE conference 2009, Snowbird, Journal of Modern Optics Volume 56, Numbers 18-19, October 2009, pp. 2106-2111(6), Taylor and Francis

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- 43** *Shot noise in $SU(N)$ Quantum Dot Kondo effects*, P. Vitushinsky, A. A. Clerk, and K. Le Hur, Phys. Rev. Lett. **100**, 036603 (2008).
- 42** *Discontinuous current-phase relations in small 1D Josephson junction arrays*, Jens Koch and Karyn Le Hur, Phys. Rev. Lett. **101**, 097007 (2008).
- 41** *Dissipative Quantum Ising model in a cold atomic spin-boson mixture*, Peter P. Orth, Ivan Stanic, Karyn Le Hur, Phys. Rev. A **77**, 051601 (2008).
- 40** *Double-gap superconducting proximity effect in nanotubes*, Karyn Le Hur, Smitha Vishveshwara, Cristina Bena, Phys. Rev B **77**, 041406(R) (2008).
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