# Mme Karyn LE HUR: Publications

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

7422 citations; H-index 49; 2470 citations since 2020 (July 2025).

## 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 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 2025
**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
**144** *Bipartite Fluctuations and Charge Fractionalization in Quantum Wires*
Magali Korolev, Karyn Le Hur, arXiv:2501.14410, submitted to Physical Review.
**143** *Topological Quantum Spin Hall Semimetals with Light*
Karyn Le Hur, arXiv:2412.07304, accepted for publication in Physical Review Research and Physical Review Journals 2025.
**142** *Topological p-wave Superconductors with Disorder and Interactions*
Frederick del Pozo, Löic 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).

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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**132** *Hubbard model on the Kagome lattice with time-reversal invariant flux and spin-orbit coupling*,
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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).

Publications 2021
**129** *Kondo induced $\pi$-phase shift of microwave photons in a circuit quantum electrodynamics architecture*, Guang-Wei Deng, Loic Henriet, 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*,
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**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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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*,
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 $\pi$-synchronization in the Bose-Hubbard Model*,
Andrea Pizzi, Fabrizio Dolcini, Karyn Le Hur, arXiv:1810.12414
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**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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**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,
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*
Tal Goren, Karyn Le Hur, Eric Akkermans, arXiv:1611.06738.

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**107** *Majorana Spin Liquids, Topology and Superconductivity in Ladders*
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**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).
**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).

Publications 2016
**102** *Many-terminal Majorana island: from Topological to Multi-Channel Kondo Model*
Loïc Herviou, Karyn Le Hur, Christophe Mora Phys. Rev. B **94**, 235102 (2016).
**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).
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**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
Loïc Herviou, Christophe Mora, Karyn Le Hur, Phys. Rev. B **93**, 165142 (2016), 24 pages.
**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 Henriet, Karyn Le Hur, Phys. Rev. B **93**, 064411 (2016) (24 pages).

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

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**87** *Tunable Hybrid Quantum Electrodynamics from Non-Linear Electron Transport*,
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**86** *Anisotropic Quantum Spin Hall Effect, Spin-Orbital Textures and Mott Transition*,
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**85** *Strongly-Correlated Thermoelectric Transport beyond Linear Response*,
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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*,
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*,
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**80*** *Correlated Topological Phases and Exotic Magnetism with Ultracold Fermions*
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**79** *Low Frequency Admittance as a Probe of Majorana Fermions*
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**78** *Non-equilibrium Quantum Transport through a dissipative resonant level model*
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**77*** *Non-perturbative stochastic method for driven spin-boson model*
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**75** *Kondo resonance of a microwave photon*
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**74*** *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
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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*
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**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 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)
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**66*** *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** 2963-2999 (2011).
**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).
**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-Hou Chung, I. Paul, Phys. Rev. B **84**, 024526 (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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**59** *Dynamics, Synchronization and Quantum Phase Transitions of Two Dissipative Spins*, Peter P. Orth, David Roosen, Walter Hofstetter and Karyn Le Hur, Phys. Rev. B **82**, 144423 (2010) (Editors' Suggestion).
**58** *Topological Insulators and Mott physics from the Hubbard Interaction*, Stephan Rachel and Karyn Le Hur, Phys. Rev. B **82**, 075106 (2010).
**57** *Tunable Kondo-Luttinger systems far from equilibrium*, C.-H. Chung, K.V.P. Latha, K. Le Hur, M. Vojta and P. Wölfle, Phys. Rev. B **82**, 115325 (2010).
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**52*** *Superconductivity close to the Mott state: From condensed-matter systems to Superfluidity in optical lattices*, K. Le Hur and T. Maurice Rice, review article,
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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.

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**50** *Superfluid-Mott Insulator Transition of Light in the Jaynes-Cummings Lattice*, Jens Koch and Karyn Le Hur, Phys. Rev. A **80**, 023811 (2009), 13 pages.
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**47** *Non-equilibrium transport at a dissipative quantum phase transition*, Chung-Hou Chung, Karyn Le Hur, Matthias Vojta, Peter Wölfle, 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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**44** *Charge Fractionalization in nonchiral Luttinger systems*,
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**38** *Entanglement and Criticality in Quantum Impurity Systems*,
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