Bibliography

[1] X. L. Qi and S. C. Zhang. "Topological insulators and superconductors". *Reviews of Modern Physics*, **83**, 1057 (2011).

[2] M. Hasan and C. Kane. "Colloquium: topological insulators". *Reviews of Modern Physics*, **82**, 3045–3067 (2010).

[3] P. A. Lee, N. Nagaosa, and X. G. Wen. "Doping a Mott insulator: Physics of high-temperature superconductivity". *Reviews of Modern Physics*, **78**, 17 (2006).

[4] K. K. Gomes, W. Mar, W. Ko, et al. "Designer Dirac fermions and topological phases in molecular graphene". *Nature*, **483**, 306–310 (2012).

[5] M. Polini, F. Guinea, M. Lewenstein, et al. "Artificial honeycomb lattices for electrons, atoms and photons". *Nature Nanotechnology*, **8**, 625–633 (2013).

[6] E. Kalesaki, C. Delerue, C. M. Smith, et al. "Dirac cones, topological edge states, and nontrivial flat bands in two-dimensional semiconductors with a honeycomb nanogeometry". *Physical Review X*, **4**, 011010 (2014).

[7] I. Carusotto and C. Ciuti. "Quantum fluids of light". *Reviews of Modern Physics*, **85**, 299 (2013).

[8] M. Hafezi, E. A. Demler, M. D. Lukin, et al. "Robust optical delay lines with topological protection". *Nature Physics*, **7**, 907–912 (2011).

[9] M. Hafezi, S. Mittal, J. Fan, et al. "Imaging topological edge states in silicon photonics". *Nature Photonics*, **7**, 1001–1005 (2013).

[10] M. C. Rechtsman, J. M. Zeuner, Y. Plotnik, et al. "Photonic Floquet topological insulators". *Nature*, **496**, 196–200 (2013).

[11] T. Jacqmin, I. Carusotto, I. Sagnes, et al. "Direct observation of Dirac cones and a flatband in a honeycomb lattice for polaritons". *Physical Review Letters*, **112**, 116402 (2014).

[12] L. Tarruell, D. Greif, T. Uehlinger, et al. "Creating, moving and merging Dirac points with a Fermi gas in a tunable honeycomb lattice". *Nature*, **483**, 302–305 (2012).

[13] M. A. Vozmediano, M. Katsnelson, and F. Guinea. "Gauge fields in graphene". *Physics Reports*, **496**, 109–148 (2010).

[14] F. Guinea, M. Katsnelson, and A. Geim. "Energy gaps and a zero-field quantum Hall effect in graphene by strain engineering". *Nature Physics*, **6**, 30–33 (2010).

[15] N. Levy, S. Burke, K. Meaker, et al. "Strain-induced pseudo–magnetic fields greater than 300 tesla in graphene nanobubbles". *Science*, **329**, 544–547 (2010).

[16] P. San-Jose, J. Gonzalez, and F. Guinea. "Non-Abelian gauge potentials in graphene bilayers". *Physical Review Letters*, **108**, 216802 (2012).

[17] J. Dalibard, F. Gerbier, G. Juzeliūnas, et al. "Colloquium: Artificial gauge potentials for neutral atoms". *Reviews of Modern Physics*, **83**, 1523 (2011).

[18] N. Goldman, G. Juzeliūnas, P. Öhberg, et al. "Light-induced gauge fields for ultracold atoms". *Reports on Progress in Physics*, **77**, 126401 (2014).

[19] H. Zhai. "Spin-orbit coupled quantum gases". *International Journal of Modern Physics B*, **26**, 1230001 (2012).

[20] H. Zhai. "Degenerate quantum gases with spin–orbit coupling: a review". *Reports on Progress in Physics*, **78**, 026001 (2015).

[21] J. H. Shirley. "Solution of the Schrödinger equation with a Hamiltonian periodic in time". *Physical Review*, **138**, B979 (1965).

[22] H. Sambe. "Steady states and quasienergies of a quantum-mechanical system in an oscillating field". *Physical Review A*, **7**, 2203 (1973).

[23] M. M. Maricq. "Application of average Hamiltonian theory to the NMR of solids". *Physical Review B*, **25**, 6622 (1982).

[24] T. Grozdanov and M. Raković. "Quantum system driven by rapidly varying periodic perturbation". *Physical Review A*, **38**, 1739 (1988).

[25] P. H. Milena Grifoni. "Driven quantum tunneling". *Physics Reports*, **304**, 229–354 (1998).

[26] S. Rahav, I. Gilary, and S. Fishman. "Effective Hamiltonians for periodically driven systems". *Physical Review A*, **68**, 013820 (2003).

[27] N. Goldman and J. Dalibard. "Periodically driven quantum systems: effective Hamiltonians and engineered gauge fields". *Physical Review X*, **4**, 031027 (2014).

[28] F. Grossmann, T. Dittrich, P. Jung, et al. "Coherent destruction of tunneling". *Physical Review Letters*, **67**, 516 (1991).

[29] F. Grossmann and P. Hänggi. "Localization in a driven two-level dynamics". *Europhysics Letters*, **18**, 571 (1992).

[30] S. Fishman, D. Grempel, and R. Prange. “Chaos, quantum recurrences, and Anderson localization”. *Physical Review Letters*, **49**, 509 (1982).

[31] H. Ammann, R. Gray, I. Shvarchuck, et al. “Quantum delta-kicked rotor: Experimental observation of decoherence”. *Physical Review Letters*, **80**, 4111 (1998).

[32] P. Kapitza. “Dynamic stability of a pendulum with an oscillating point of suspension”. *Journal of Experimental and Theoretical physics*, **21**, 588–597 (1951).

[33] H. Broer, I. Hoveijn, M. Van Noort, et al. “The parametrically forced pendulum: A case study in 1 1/2 degree of freedom”. *Journal of Dynamics and Differential Equations*, **16**, 897–947 (2004).

[34] F. Haake. *Quantum signatures of chaos* (Springer, 2010).

[35] V. M. Bastidas, C. Emary, B. Regler, et al. “Nonequilibrium quantum phase transitions in the Dicke model”. *Physical Review Letters*, **108**, 043003 (2012).

[36] V. M. Bastidas, C. Emary, G. Schaller, et al. “Nonequilibrium quantum phase transitions in the Ising model”. *Physical Review A*, **86**, 063627 (2012).

[37] G. Engelhardt, V. M. Bastidas, C. Emary, et al. “Ac-driven quantum phase transition in the Lipkin-Meshkov-Glick model”. *Physical Review E*, **87**, 052110 (2013).

[38] V. M. Bastidas, P. Pérez-Fernández, M. Vogl, et al. “Quantum criticality and dynamical instability in the kicked-top model”. *Physical Review Letters*, **112**, 140408 (2014).

[39] T. Nag, D. Sen, and A. Dutta. “Maximum group velocity in a one-dimensional model with a sinusoidally varying staggered potential”. *Physical Review A*, **91**, 063607 (2015).

[40] T. Nag, S. Roy, A. Dutta, et al. “Dynamical localization in a chain of hard core bosons under periodic driving”. *Physical Review B*, **89**, 165425 (2014).

[41] S. Rahav, I. Gilary, and S. Fishman. “Time independent description of rapidly oscillating potentials”. *Physical Review Letters*, **91**, 110404 (2003).

[42] N. Goldman, J. Dalibard, M. Aidelsburger, et al. “Periodically driven quantum matter: The case of resonant modulations”. *Physical Review A*, **91**, 033632 (2015).

[43] A. Eckardt and E. Anisimovas. “High-frequency approximation for periodically driven quantum systems from a Floquet-space perspective”. *New Journal of Physics*, **17**, 093039 (2015).

[44] M. M. Maricq. “Application of average Hamiltonian theory to the NMR of solids”. *Physical Review B*, **25**, 6622 (1982).

[45] M. M. Maricq. "Relaxation and equilibrium of a spin system coupled to a radiation field". *Physical Review B*, **37**, 7215 (1988).

[46] W. Magnus. "On the exponential solution of differential equations for a linear operator". *Communications on Pure and Applied Mathematics*, **7**, 649–673 (1954).

[47] A. Verdeny, A. Mielke, and F. Mintert. "Accurate effective Hamiltonians via unitary flow in Floquet space". *Physical Review Letters*, **111**, 175301 (2013).

[48] H. P. Breuer and M. Holthaus. "A semiclassical theory of quasienergies and Floquet wave functions". *Annals of Physics*, **211**, 249–291 (1991).

[49] M. Aidelsburger, M. Atala, M. Lohse, et al. "Realization of the Hofstadter Hamiltonian with ultracold atoms in optical lattices". *Physical Review Letters*, **111**, 185301 (2013).

[50] H. Miyake, G. A. Siviloglou, C. J. Kennedy, et al. "Realizing the Harper Hamiltonian with laser-assisted tunneling in optical lattices". *Physical Review Letters*, **111**, 185302 (2013).

[51] M. Aidelsburger, M. Lohse, C. Schweizer, et al. "Measuring the Chern number of Hofstadter bands with ultracold bosonic atoms". *Nature Physics*, **11**, 162–166 (2015).

[52] D. Jaksch and P. Zoller. "The cold atom Hubbard toolbox". *Annals of Physics*, **315**, 52–79 (2005).

[53] T. Kitagawa, T. Oka, A. Brataas, et al. "Transport properties of nonequilibrium systems under the application of light: Photoinduced quantum Hall insulators without Landau levels". *Physical Review B*, **84**, 235108 (2011).

[54] J. N. Bandyopadhyay and T. G. Sarkar. "Effective time-independent analysis for quantum kicked systems". *Physical Review E*, **91**, 032923 (2015).

[55] J. Wang and J. Gong. "Generating a fractal butterfly Floquet spectrum in a class of driven SU (2) systems". *Physical Review E*, **81**, 026204 (2010).

[56] J. Wang and J. Gong. "Proposal of a cold-atom realization of quantum maps with Hofstadter's butterfly spectrum". *Physical Review A*, **77**, 031405 (2008).

[57] J. Wang and J. Gong. "Butterfly floquet spectrum in driven SU (2) systems". *Physical Review Letters*, **102**, 244102 (2009).

[58] J. N. Bandyopadhyay, J. Wang, and J. Gong. "Generating a fractal butterfly Floquet spectrum in a class of driven SU (2) systems: Eigenstate statistics". *Physical Review E*, **81**, 066212 (2010).

[59] C. E. Creffield, G. Pieplow, F. Sols, et al. "Realization of uniform synthetic magnetic fields by periodically shaking an optical square lattice". *New Journal of Physics*, **18**, 093013 (2016).

[60] F. Moore, J. Robinson, C. Bharucha, et al. "Atom optics realization of the quantum δ-kicked rotor". *Physical Review Letters*, **75**, 4598 (1995).

[61] M. d'Arcy, R. Godun, M. Oberthaler, et al. "Quantum enhancement of momentum diffusion in the delta-kicked rotor". *Physical Review Letters*, **87**, 074102 (2001).

[62] H. Lignier, J. Chabé, D. Delande, et al. "Reversible destruction of dynamical localization". *Physical Review Letters*, **95**, 234101 (2005).

[63] G. Duffy, S. Parkins, T. Müller, et al. "Experimental investigation of early-time diffusion in the quantum kicked rotor using a Bose-Einstein condensate". *Physical Review E*, **70**, 056206 (2004).

[64] D. R. Hofstadter. "Energy levels and wave functions of Bloch electrons in rational and irrational magnetic fields". *Physical Review B*, **14**, 2239 (1976).

[65] M. Strzys, E. Graefe, and H. Korsch. "Kicked Bose–Hubbard systems and kicked tops—destruction and stimulation of tunneling". *New Journal of Physics*, **10**, 013024 (2008).

[66] G. Milburn, J. Corney, E. M. Wright, et al. "Quantum dynamics of an atomic Bose-Einstein condensate in a double-well potential". *Physical Review A*, **55**, 4318 (1997).

[67] J. Liu, W. Wang, C. Zhang, et al. "Fidelity for the quantum evolution of a Bose-Einstein condensate". *Physical Review A*, **72**, 063623 (2005).

[68] Q. Xie and W. Hai. "Quantum entanglement and chaos in kicked two-component Bose-Einstein condensates". *The European Physical Journal D-Atomic, Molecular, Optical and Plasma Physics*, **33**, 265–272 (2005).

[69] J. N. Bandyopadhyay and A. Lakshminarayan. "Entanglement production in coupled chaotic systems: Case of the kicked tops". *Physical Review E*, **69**, 016201 (2004).

[70] M. Feingold and A. Peres. "Regular and chaotic motion of coupled rotators". *Physica D: Nonlinear Phenomena*, **9**, 433–438 (1983).

[71] M. Feingold, N. Moiseyev, and A. Peres. "Ergodicity and mixing in quantum theory. II". *Physical Review A*, **30**, 509 (1984).

[72] Y. Fan, S. Gnutzmann, Y. Liang, et al. "Quantum chaos for nonstandard symmetry classes in the Feingold-Peres model of coupled tops". *Physical Review E*, **96**, 062207 (2017).

[73] A. Altland and M. R. Zirnbauer. "Nonstandard symmetry classes in mesoscopic normal-superconducting hybrid structures". *Physical Review B*, **55**, 1142 (1997).

[74] J. H. Shirley. *Interaction of a quantum system with a strong oscillating field*. Ph.D. thesis, California Institute of Technology (1963).

[75] L. Privitera. *Non-equilibrium aspects of topological Floquet quantum systems*. Ph.D. thesis, SISSA (2017).

[76] T. Mikami, S. Kitamura, K. Yasuda, et al. "Brillouin-Wigner theory for high-frequency expansion in periodically driven systems: Application to Floquet topological insulators". *Physical Review B*, **93**, 144307 (2016).

[77] F. Casas, J. Oteo, and J. Ros. "Floquet theory: exponential perturbative treatment". *Journal of Physics A: Mathematical and General*, **34**, 3379 (2001).

[78] I. Hubač and S. Wilson. *Brillouin-Wigner methods for many-body systems* (Springer, 2010).

[79] A. Lichtenberg and M. Lieberman. *Regular and Chaotic Dynamics, 2nd Edition*, vol. 38 (Springer-Verlag, New York, 1992).

[80] M. Tabor. *Chaos and Integrability in Nonlinear Dynamics: An Introduction* (Wiley, 1989).

[81] H. J. Stöckman. *Quantum Chaos: An Introduction* (Cambridge University Press, 2007).

[82] O. Bohigas, M. J. Giannoni, and C. Schmit. "Characterization of chaotic quantum spectra and universality of level fluctuation laws". *Physical Review Letters*, **52**, 1 (1984).

[83] T. Geisel, R. Ketzmerick, and G. Petschel. "Metamorphosis of a Cantor spectrum due to classical chaos". *Physical Review Letters*, **67**, 3635 (1991).

[84] R. Ketzmerick, G. Petschel, and T. Geisel. "Slow decay of temporal correlations in quantum systems with Cantor spectra". *Physical Review Letters*, **69**, 695 (1992).

[85] P. Leboeuf, J. Kurchan, M. Feingold, et al. "Phase-space localization: topological aspects of quantum chaos". *Physical Review Letters*, **65**, 3076 (1990).

[86] R. Lima and D. Shepelyansky. "Fast delocalization in a model of quantum kicked rotator". *Physical Review Letters*, **67**, 1377 (1991).

[87] I. Dana. "Kicked Harper models and kicked charge in a magnetic field". *Physics Letters A*, **197**, 413–416 (1995).

[88] I. Dana and D. L. Dorofeev. "General approach to the quantum kicked particle in a magnetic field: Quantum-antiresonance transition". *Physical Review E*, **72**, 046205 (2005).

[89] N. Goldman. "Mott-insulator transition for ultracold fermions in two-dimensional optical lattices". *Physical Review A*, **77**, 053406 (2008).

[90] P. G. Harper. "Single band motion of conduction electrons in a uniform magnetic field". *Proceedings of the Physical Society. Section A*, **68**, 874 (1955).

[91] B. Simon. “Kotani theory for one dimensional stochastic Jacobi matrices”. *Communications in Mathematical Physics*, **89**, 227–234 (1983).

[92] A. Avila and S. Jitomirskaya. “The ten martini problem”. *Annals of Mathematics*, **170**, 303–342 (2009).

[93] A. Peres. *Quantum Theory: Concepts and Methods* (Kluwer Academic Publishers, Dordrecht, 2002).

[94] M. Schreiber and H. Grussbach. “Multifractal wave functions at the Anderson transition”. *Physical Review Letters*, **67**, 607 (1991).

[95] R. Hilborn. *Chaos and Nonlinear Dynamics* (New York: Oxford University Press, 1994).

[96] I. I. Satija. “A tale of two fractals: the Hofstadter butterfly and the integral Apollonian gaskets”. *The European Physical Journal Special Topics*, **225**, 2533–2547 (2016).

[97] I. I. Satija. *The Butterfly in the Quantum World: The story of the most fascinating quantum fractal* (Morgan & Claypool Publishers, 2016).

[98] G. H. Hardy and E. M. Wright. *An introduction to the theory of numbers* (Oxford University Press, 1979).

[99] B. Paredes, A. Widera, V. Murg, et al. “Tonks–Girardeau gas of ultracold atoms in an optical lattice”. *Nature*, **429**, 277–281 (2004).

[100] T. Kinoshita, T. Wenger, and D. S. Weiss. “Observation of a one-dimensional Tonks-Girardeau gas”. *Science*, **305**, 1125–1128 (2004).

[101] L. Tonks. “The complete equation of state of one, two and three-dimensional gases of hard elastic spheres”. *Physical Review*, **50**, 955 (1936).

[102] M. Girardeau. “Relationship between systems of impenetrable bosons and fermions in one dimension”. *Journal of Mathematical Physics*, **1**, 516–523 (1960).

[103] E. Lieb, T. Schultz, and D. Mattis. “Two soluble models of an antiferromagnetic chain”. *Annals of Physics*, **16**, 407–466 (1961).

[104] D. Thouless. “Quantization of particle transport”. *Physical Review B*, **27**, 6083 (1983).

[105] M. M. Wauters, A. Russomanno, R. Citro, et al. “Localization, Topology, and Quantized Transport in Disordered Floquet Systems”. *Physical Review Letters*, **123**, 266601 (2019).

[106] I. Klich, C. Lannert, and G. Refael. “Supercurrent survival under a rosen-zener quench of hard-core bosons”. *Physical Review Letters*, **99**, 205303 (2007).

[107] S. Maity, U. Bhattacharya, and A. Dutta. "Fate of current, residual energy, and entanglement entropy in aperiodic driving of one-dimensional Jordan-Wigner integrable models". *Physical Review B*, **98**, 064305 (2018).

[108] A. Russomanno, A. Silva, and G. E. Santoro. "Periodic steady regime and interference in a periodically driven quantum system". *Physical Review Letters*, **109**, 257201 (2012).

[109] P. Calabrese and J. Cardy. "Time dependence of correlation functions following a quantum quench". *Physical Review Letters*, **96**, 136801 (2006).

[110] M. Cheneau, P. Barmettler, D. Poletti, et al. "Light-cone-like spreading of correlations in a quantum many-body system". *Nature*, **481**, 484–487 (2012).

[111] P. A. Miller and S. Sarkar. "Signatures of chaos in the entanglement of two coupled quantum kicked tops". *Physical Review E*, **60**, 1542 (1999).

[112] J. N. Bandyopadhyay and A. Lakshminarayan. "Testing statistical bounds on entanglement using quantum chaos". *Physical Review Letters*, **89**, 060402 (2002).

[113] M. R. Zirnbauer. "Riemannian symmetric superspaces and their origin in random-matrix theory". *Journal of Mathematical Physics*, **37**(10), 4986–5018 (1996).

[114] J. Martin. "Generalized classical dynamics, and the 'classical analogue'of a Fermioscillator". *Proceedings of the Royal Society of London. Series A. Mathematical and Physical Sciences*, **251**, 536–542 (1959).