

## MARTIN GREITER

Lehrstuhl für Theoretische Physik I, Julius-Maximilians-Universität Würzburg

## PUBLICATIONS

### Books and Reviews

- [1] M. Greiter, *Mapping of parent Hamiltonians: from Abelian and non-Abelian quantum Hall states to exact models of critical spin chains*, Springer Tracts of Modern Physics, Vol. 244 (Springer, Berlin, 2011).
- [2] M. Greiter, *Is electromagnetic gauge invariance spontaneously violated in superconductors*, Annals of Physics **319**, 217 (2005).

### Science, Nature and Nature Physics

- [3] S. Weidemann, M. Kremer, T. Helbig, T. Hofmann, A. Stegmaier, M. Greiter, R. Thomale, and A. Szameit, *Topological Funneling of Light*, published in Science 2020/3/26.
- [4] D. Di Sante, J. Erdmenger, M. Greiter, I. Matthaikakakis, R. Meyer, D. Rodriguez Fernandez, R. Thomale, E. van Loon, and T. Wehling, *Turbulent hydrodynamics in strongly correlated Kagome metals*, submitted to Nature Physics.
- [5] T. Helbig, T. Hofmann, S. Imhof, M. Abdelghany, T. Kiessling, L.W. Molenkamp, C. Hua Lee, A. Szameit, M. Greiter, and R. Thomale, *Observation of the non-Hermitian skin effect*, submitted to Nature Physics.
- [6] S. Imhof, C. Berger, F. Bayer, J. Brehm, L. Molenkamp, T. Kiessling, F. Schindler, C.H. Lee, M. Greiter, T. Neupert, and R. Thomale, *Topoelectrical circuit realization of topological corner modes*, Nature Physics **14**, 925 (2018).
- [7] P. Sessi, D. Di Sante, A. Szczerbakow, F. Glott, S. Wilfert, H. Schmidt, T. Bathon, P. Dziawa, M. Greiter, T. Neupert, G. Sangiovanni, T. Story, R. Thomale, and M. Bode, *Robust spin-polarized midgap states at step edges of topological crystalline insulators*, Science **354**, 1269 (2016).
- [8] M. Greiter, *Confinement in a quantum magnet*, Nature Physics **6**, 5 (2010).

### Letters

- [9] T. Hofmann, T. Helbig, C.H. Lee, M. Greiter, and R. Thomale, *Chiral Voltage Propagation and Calibration in a Topoelectrical Chern Circuit*, Phys. Rev. Lett. **122**, 247702 (2019).
- [10] T. Neupert, S. Rachel, R. Thomale, and M. Greiter, *Interacting Surface States of Three-Dimensional Topological Insulators*, Phys. Rev. Lett. **115**, 017001 (2015).
- [11] R. Lundgren, J. Blair, M. Greiter, A. Läuchli, G.A. Fiete, and R. Thomale, *Momentum-Space Entanglement Spectrum of Bosons and Fermions with Interactions*, Phys. Rev. Lett. **113**, 256404 (2014).
- [12] M. Greiter and R. Thomale, *Non-abelian statistics in a quantum antiferromagnet*, Phys. Rev. Lett. **102**, 207203 (2009).

- [13] D.F. Schroeter, E. Kapit, R. Thomale, and M. Greiter, *Spin Hamiltonian for which the chiral spin liquid is the exact ground state*, Phys. Rev. Lett. **99**, 097202 (2007).
- [14] M. Greiter and R. Thomale, *No evidence for spontaneous orbital currents in finite size studies of three-band models for CuO planes*, Phys. Rev. Lett. **99**, 027005 (2007).
- [15] M. Greiter and D. Schuricht, *Many spinon states and the secret significance of Young tableaux*, Phys. Rev. Lett. **98**, 237202 (2007).
- [16] D. Schuricht and M. Greiter, *Complementary colors of colorons: the elementary excitations of the  $SU(3)$  Haldane–Shastry model*, Europhys. Lett. **71**, 987 (2005).
- [17] M. Greiter, *Is the  $\pi$  particle responsible for the 41 meV peak in  $YBa_2Cu_3O_7$ ?*, Phys. Rev. Lett. **79**, 4898 (1997).
- [18] M. Greiter, *Microscopic formulation of the hierarchy of quantized Hall states*, Phys. Lett. B **336**, 48 (1994).
- [19] M. Greiter, G.G. Lonzarich, and L. Taillefer, *Effect of uniaxial stress on the onset of superconductivity in  $UPt_3$* , Phys. Lett. A **169**, 199 (1992).
- [20] M. Greiter, X.G. Wen, and F. Wilczek, *Paired Hall state at half filling*, Phys. Rev. Lett. **66**, 3205 (1991).
- [21] M. Greiter and F. Wilczek, *Heuristic principle for quantized Hall states*, Mod. Phys. Lett. B **4**, 1063 (1990).
- [22] M. Greiter, F. Wilczek, and E. Witten, *Hydrodynamic relations in superconductivity*, Mod. Phys. Lett. B **3**, 903 (1989).

## Comments

- [23] M. Greiter and D. Schuricht, *Comment on “Spinon attraction in spin-1/2 antiferromagnetic chains”*, Phys. Rev. Lett. **96**, 059701 (2006).

## Rapid Communications

- [24] V. Peri, S. Ok, S.S. Tsirkin, T. Neupert, G. Baskaran, M. Greiter, R. Moessner, and R. Thomale, *Non-Abelian chiral spin liquid on a simple non-Archimedean lattice*, Phys. Rev. B **101**, 041114(R) (2020)
- [25] M. Greiter, V. Schnells, and R. Thomale, *Method to identify parent Hamiltonians for trial states*, Phys. Rev. B **98**, 081113(R) (2018).
- [26] R. Lundgren, J. Blair, P. Laurell, N. Regnault, G.A. Fiete, M. Greiter, and R. Thomale, *Universal entanglement spectra in critical spin chains*, Phys. Rev. B **94**, 081112(R) (2016).
- [27] Y. Iqbal, H.O. Jeschke, J. Reuther, R. Valentí, I.I. Mazin, M. Greiter, and R. Thomale, *Paramagnetism in the kagome compounds  $(Zn,Mg,Cd)Cu_3(OH)_6Cl$* , Phys. Rev. B **92**, 220404(R) (2015).
- [28] T. Meng, T. Neupert, M. Greiter, and R. Thomale, *Coupled-wire construction of chiral spin liquids*, Phys. Rev. B **91**, 241106(R) (2015).
- [29] B. Scharfenberger, R. Thomale, and M. Greiter, *Non-Abelian statistics and a hierarchy of fractional spin liquids in spin- $S$  antiferromagnets*, Phys. Rev. B **84**, 140404(R) (2011).

- [30] S. Rachel, R. Thomale, M. Führinger, P. Schmitteckert, and M. Greiter, *Spinon confinement and the Haldane gap in  $SU(N)$  spin chains*, Phys. Rev. B **80**, 180420(R) (2009)
- [31] M. Greiter, S. Rachel, and D. Schuricht, *Exact results for  $SU(3)$  spin chains: trimer states, valence bond solids, and their parent Hamiltonians*, Phys. Rev. B **75**, 060401(R) (2007).

## Articles

- [32] T. Hofmann, T. Helbig, F. Schindler, N. Salgo, M. Brzezińska, M. Greiter, T. Kiessling, D. Wolf, A. Vollhardt, A. Kabaši, C.H. Lee, A. Bilušić, R. Thomale, and T. Neupert, *Reciprocal skin effect and its realization in a topoelectrical circuit*, submitted to Phys. Rev. X.
- [33] C.H. Lee, T. Hofmann, T. Helbig, Y. Liu, X. Zhang, M. Greiter, and R. Thomale, *Imaging nodal knots in momentum space through topoelectrical circuits*, submitted to Nature Communications.
- [34] M. Greiter, F.D.M. Haldane, and R. Thomale, *Non-Abelian Statistics in one dimension: topological momentum spacings and  $SU(2)$  level  $k$  fusion rules*, Phys. Rev. B **100**, 115107 (2019).
- [35] M. Greiter and R. Thomale, *Landau level quantization of Dirac electrons on the sphere*, Ann. Phys. **394**, 33 (2018).
- [36] M. Sekania, S. Plugge, M. Greiter, R. Thomale, and P. Schmitteckert, *Braiding errors in interacting Majorana quantum wires*, Phys. Rev. B **96**, 094307 (2017).
- [37] M. Greiter, V. Schnells, and R. Thomale, *Laughlin states and their quasiparticle excitations on the torus*, Phys. Rev. B **93**, 245156 (2016).
- [38] M. Greiter, D.F. Schroeter, and R. Thomale, *Parent Hamiltonian for the non-Abelian chiral spin liquid*, Phys. Rev. B **89**, 165125 (2014).
- [39] M. Greiter, V. Schnells, and R. Thomale, *The 1D Ising model and topological order in the Kitaev chain*, Ann. Phys. **351**, 1026 (2014).
- [40] B. Scharfenberger and M. Greiter, *Momentum classification of  $SU(n)$  spin chains using extended Young tableaux*, J. Phys. A **45**, 455202 (2012).
- [41] R. Thomale, S. Rachel, P. Schmitteckert, and M. Greiter, *Family of spin- $S$  chain representations of  $SU(2)_k$  Wess–Zumino–Witten models*, Phys. Rev. B **85**, 195149 (2012).
- [42] M. Greiter and R. Thomale, *Generalizations of Perelomov’s identity on the completeness of coherent states*, Phys. Rev. B **85**, 155145 (2012).
- [43] M. Greiter and H. Schmidt, *Magnetic excitations in the site-centered stripe phase: spin wave theory of coupled three-leg ladders*, Phys. Rev. B **83**, 144422 (2011).
- [44] M. Greiter, *Landau level quantization on the sphere*, Phys. Rev. B **83**, 115129 (2011).
- [45] M. Greiter and H. Schmidt, *Evidence for site-centered stripes from magnetic excitations in CuO superconductors*, Phys. Rev. B **82**, 144509 (2010).
- [46] M. Greiter, *On the linear dispersion–linear potential quantum oscillator*, Ann. Phys. **325**, 1349 (2010).

- [47] R. Thomale, E. Kapit, D.F. Schroeter, and M. Greiter, *Parent Hamiltonian for the chiral spin liquid*, Phys. Rev. B **80**, 104406 (2009).
- [48] M. Greiter, *Statistical phases and momentum spacings for one-dimensional anyons*, Phys. Rev. B **79**, 064409 (2009).
- [49] S. Rachel and M. Greiter, *Exact models for trimerization and tetramerization in spin chains*, Phys. Rev. B **78**, 134415 (2008).
- [50] M. Fühlinger, S. Rachel, R. Thomale, M. Greiter, and P. Schmitteckert, *DMRG studies of critical models of  $SU(N)$  spin chains*, Ann. Phys. (Berlin) **17**, 922 (2008).
- [51] R. Thomale and M. Greiter, *Numerical analysis of three-band models for CuO planes as candidates for a spontaneous  $T$ -violating orbital current phase*, Phys. Rev. B **77**, 094511 (2008).
- [52] M. Greiter and S. Rachel, *Valence bond solids for  $SU(n)$  spin chains: exact models, spinon confinement, and the Haldane gap*, Phys. Rev. B **75**, 184441 (2007).
- [53] R. Thomale, D. Schuricht, and M. Greiter, *Charge excitations in  $SU(n)$  spin chains: exact results for the  $1/r^2$  model*, Phys. Rev. B **75**, 024405 (2007).
- [54] R. Thomale, D. Schuricht, and M. Greiter, *Exact two-holon wave functions in the Kuramoto–Yokoyama model*, Phys. Rev. B **74**, 024423 (2006).
- [55] D. Schuricht and M. Greiter, *Coloron excitations of the  $SU(3)$  Haldane–Shastry model*, Phys. Rev. B **73**, 235105 (2006).
- [56] M. Greiter and D. Schuricht, *No attraction between spinons in the Haldane–Shastry model*, Phys. Rev. B **71**, 224424 (2005).
- [57] D. Schuricht and M. Greiter, *Contemplations on Dirac’s equation and quaternionic coordinates*, Eur. J. Phys. **25**, 755 (2004).
- [58] M. Greiter and D. Schuricht, *Imaginary in all directions: an elegant formulation of special relativity and classical electrodynamics*, Eur. J. Phys. **24**, 397 (2003).
- [59] M. Greiter,  *$S = 1$  spin liquids: broken discrete symmetries restored*, J. Low Temp. Phys. **126**, 1029 (2002).
- [60] M. Greiter, *Fictitious flux confinement: magnetic pairing in coupled spin chains or planes*, Phys. Rev. B **66**, 054505 (2002).
- [61] M. Greiter, *The two-leg  $t$ – $J$  ladder: a spin liquid generated by Gutzwiller projection of magnetic bands*, Phys. Rev. B **65**, 134443 (2002).
- [62] M. Greiter, *Short distance physics of fractionally quantized Hall fluids*, Int. J. Mod. Phys. B **13**, 1293 (1998).
- [63] M. Greiter, *Quantum Hall quarks*, Physica E **1**, 1 (1997).
- [64] M. Greiter and I.A. McDonald, *Hierarchy of quantized Hall states in double layer electron systems*, Nucl. Phys. B **410**, 521 (1993).
- [65] M. Greiter, X.G. Wen, and F. Wilczek, *Paired Hall state in double layer electron system*, Phys. Rev. B **45**, 9586 (1992).
- [66] M. Greiter, X.G. Wen, and F. Wilczek, *Paired Hall states*, Nucl. Phys. B **374**, 567 (1992).
- [67] M. Greiter and F. Wilczek, *Exact solutions and the adiabatic heuristic for quantized Hall states*, Nucl. Phys. B **370**, 577 (1992).

## Dissertations

- [68] M. Greiter, *Mapping of parent Hamiltonians: from Abelian and non-Abelian quantum Hall states to exact models of critical spin chains*, Habilitationsschrift, Karlsruhe Institute of Technology (2011).
- [69] M. Greiter, *Paired Hall states*, Ph.D. Thesis, Harvard University (1992).
- [70] M. Greiter, *Effect of uniaxial stress on superconductivity in  $UPt_3$* , M.Phil. Thesis, University of Cambridge (1987).

## Conference Proceedings

- [71] S. Rachel, D. Schuricht, B. Scharfenberger, R Thomale, and M. Greiter, *Spontaneous parity violation in a quantum spin chain*, *J. Phys: Conf. Ser.* **200**, 022049 (2010).
- [72] D. Schuricht and M. Greiter, *Spinons in the Haldane–Shastry model: an ideal gas of half-fermions*, *Physica B* **359-361**, 1415 (2005).
- [73] M. Greiter, *The adiabatic heuristic and paired Hall states*, *Prog. of Theo. Phys. Supp.* **107**, 145 (1992).