Mark H Fischer

Publications

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Books

1 *"Machine Learning kompakt"*,
K. Choo, E. Greplova, **M. H. Fischer**, and T. Neupert,
essentials, Springer Spektrum, Wiesbaden DOI:10.1007/978-3-658-32268-7 (2021).

Papers

71 G. Wagner, C. Guo, P. J. W. Moll, T. Neupert, and **M. H. Fischer**,
"Phenomenology of bond and flux orders in kagome metals",
Phys. Rev. B **108**, 125136 (2023) (arXiv:2307.02528)

70 I. Plokhikh, C. M. III, H. Nakamura, V. Petricek, Y. Qin, V. Sazgari, J. Küspert, I. Bialo, S. Shin, O. Ivashko, M. Zimmermann, M. Medarde, A. Amato, R. Khasanov, H. Luetkens, **M. H. Fischer**, M. Z. Hasan, J. -X. Yin, T. Neupert, J. Chang, G. Xu, S. Nakatsuji, E. Pomjakushina, D. J. Gawryluk, and Z. Guguchia,
"Charge order above room-temperature in a prototypical kagome superconductor $La(Ru_{1-x}Fe_x)_3Si_2$",
arXiv:2309.09255

69 N. Astrakhantsev, G. Wagner, T. Westerhout, T. Neupert, and **M. H. Fischer**,
"Understanding Symmetry Breaking in Twisted Bilayer Graphene from Cluster Constraints",
arXiv:2308.08590

68 A. L. Szabó, **M. H. Fischer**, and M. Sigrist,
"Effects of nucleation at a first-order transition between two superconducting phases: Application to $CeRh_2As_2$",
arXiv:2307.10374

67 M. O. Soldini, N. Astrakhantsev, M. Iraola, A. Tiwari, **M. H. Fischer**, R. Valentí, M. G. Vergniory, G. Wagner, and T. Neupert,
"Interacting topological quantum chemistry of Mott atomic limits",
Phys. Rev. B **107**, 245145 (2023) (arXiv:2209.10556 2209.10556)

66 C. Guo, M. R. Delft, M. Gutierrez-Amigo, D. Chen, C. Putzke, G. Wagner, **M. H. Fischer**, T. Neupert, I. Errea, M. G. Vergniory, S. Wiedmann, C. Felser, and P. J. W. Moll,
"Distinct switching of chiral transport in the kagome metals KV_3Sb_5 and CsV_3Sb_5",
arXiv:2306.00593

65 **M. H. Fischer**, P. A. Lee, and J. Ruhman,
"A mechanism for pi phase shifts in Little-Parks experiments: application to 2H-TaS_2 intercalated with chiral molecules and to 4Hb-TaS_2",
arXiv:2304.10583

64 C. Guo, G. Wagner, C. Putzke, D. Chen, K. Wang, L. Zhang, M. Gutierrez-Amigo, I. Errea, M. G. Vergniory, C. Felser, **M. H. Fischer**, T. Neupert, and P. J. W. Moll,
"Correlated order at the tipping point in the kagome metal CsV_3Sb_5",
arXiv:2304.00972

63 **M. H. Fischer**, M. Sigrist, D. F. Agterberg, and Y. Yanase,
"Superconductivity and Local Inversion-Symmetry Breaking",
Annual Review of Condensed Matter Physics **14**, 153-172 (2023) (arXiv:2204.02449).

62 C. Guo, C. Putzke, S. Konyzheva, X. Huang, M. Gutierrez-Amigo, I. Errea, D. Chen, M. G. Vergniory, C. Felser, **M. H. Fischer**, T. Neupert, and P. J. W. Moll,
"Switchable chiral transport in charge-ordered kagome metal CsV_3Sb_5",
Nature **611**, 461–466 (2022) (arXiv:2203.09593).

61 J. Oppliger, M. M. Denner, J. Küspert, R. Frison, Q. Wang, A. Morawietz, O. Ivashko, A.-C. Dippel, M. Zimmermann, N. B. Christensen, T. Kurosawa, N. Momono, M. Oda, F. D. Natterer, M. H. Fischer, T. Neupert, and J. Chang,
"Weak-signal extraction enabled by deep-neural-network denoising of diffraction data",
arXiv:2209.09247.

60 M. O. Soldini, N. Astrakhantsev, M. Iraola, A. Tiwari, M. H. Fischer, R. Valentí, M. G. Vergniory, G. Wagner, and T. Neupert,
"Interacting topological quantum chemistry of Mott atomic limits",
arXiv:2209.10556.

59 A. Almoalem, I. Feldman, M. Shlafman, Y. E. Yaish, M. H. Fischer, M. Moshe, J. Ruhman, and A. Kanigel,
"Evidence of a two-component order parameter in 4Hb-TaS_2 in the Little-Parks effect",
arXiv:2208.13798.

58 J. Choi, Q. Wang, S. Jöhr, N. B. Christensen, J. Küspert, D. Bucher, D. Biscette, **M. H. Fischer**, M. Hücker, T. Kurosawa, N. Momono, M. Oda, O. Ivashko, M. v. Zimmermann, M. Janoschek, and J. Chang,
"Unveiling Unequivocal Charge Stripe Order in a Prototypical Cuprate Superconductor",
Phys. Rev. Lett. **128**, 207002 (2022), (arXiv:2009.06967).

57 A. Davydov, K. Choo, **M. H. Fischer**, and T. Neupert,
"Construction of low-energy symmetric Hamiltonians and Hubbard parameters for twisted multilayer systems using ab initio input",
Phys. Rev. B **105**, 165153 (2022), (arXiv:2012.12942).

56 Q. Wang, K. Arx, D. G. Mazzone, S. Mustafi, M. Horio, J. Küspert, J. Choi, D. Bucher, H. Wo, J. Zhao, W. Zhang, T. C. Asmara, Y. Sassa, M. Månsson, N. B. Christensen, M. Janoschek, T. Kurosawa, N. Momono, M. Oda, **M. H. Fischer**, T. Schmitt, and J. Chang,
"Uniaxial pressure induced stripe order rotation in $La_{1.88}Sr_{0.12}CuO_4$",
Nature Communications **13**, 1795 (2022), (arXiv:2203.09987).

55 M. F. Holst, M. Sigrist, and **M. H. Fischer**,
"Role of Topology and Symmetry for the Edge Currents of a 2D Superconductor",
Phys. Rev. Research **4**, 013244 (2022), (arXiv:2108.12337).

54 C. Guo, C. Putzke, S. Konyzheva, X. Huang, M. Gutierrez-Amigo I. Errea, D. Chen, M. G. Vergniory, C. Felser, **M. H. Fischer**, T. Neupert, and P. J. W. Moll,
"Field-tuned chiral transport in charge-ordered CsV_3Sb_5",
arXiv:2203.09593

53 P. Suchsland, P. Kl. Barkoutsos, I. Tavernelli, **M. H. Fischer**, and T. Neupert,
"Simulating a ring-like Hubbard system with a quantum computer",
Phys. Rev. Research **4**, 013165 (2022), (arXiv:2104.06428).

52 M. Iraola, N. Heinsdorf, A. Tiwari, D. Lessnich, T. Mertz, F. Ferrari, **M. H. Fischer**, S. M. Winter, F. Pollmann, T. Neupert, R. Valenti, and M. G. Vergniory,
"Towards a Topological Quantum Chemistry description of correlated systems: the case of the Hubbard diamond chain",
Phys. Rev. B **104**, 195125 (2021), (arXiv:2101.04135).

51 K. M. Bastiaans, D. Chatzopoulos, J.-F. Ge, D. Cho, W. O. Tromp, J. M. Ruitenbeek, **M. H. Fischer**, P. J. Visser, D. J. Thoen, E. F. C. Driessen, T. M. Klapwijk, and M. P. Allan,
"Direct evidence for Cooper pairing without a spectral gap in a disordered superconductor above T_C",
Science **374**, 608 (2021) (arXiv:2101.08535).

50 N. Astrakhantsev, T. Westerhout, A. Tiwari, K. Choo, A. Chen, **M. H. Fischer**, G. Carleo, and T. Neupert,
"Broken-Symmetry Ground States of the Heisenberg Model on the Pyrochlore Lattice",
Phys. Rev. X **11**, 041021 (2021) (arXiv:2101.08787).

49 X. Wu, T. Schwemmer, T. Müller, A. Consiglio, G. Sangiovanni, D. Di Sante, Y. Iqbal, W. Hanke, A. P. Schnyder, M. M. Denner, **M. H. Fischer**, T. Neupert, R. Thomale,
"Nature of unconventional pairing in the kagome superconductors AV_3Sb_5",
Phys. Rev. Lett. **127**, 177001 (2021) (arXiv:2104.05671).

48 M. M. Denner, A. Skurativska, F. Schindler, **M. H. Fischer**, R. Thomale, T. Bzdušek, and T. Neupert,
"Exceptional Topological Insulators",
Nature Communications 12, 5681 (2021) (arXiv:2008.01090).

47 A. Skurativska, M. Sigrist, and **M. H. Fischer**
"Spin response and topology of a staggered Rashba superconductor",
Phys. Rev. Research **3**, 033133 (2021) (arXiv:2103.06282).

46 A. Skurativska, S. S. Tsirkin, F. D. Natterer, T. Neupert, and **M. H. Fischer**,
"Flat bands with fragile topology through superlattice engineering on single-layer graphene",
Phys. Rev. Research **3**, L032003 (2021) (arXiv:2101.08273).

45 P. Suchsland, F. Tacchino, **M. H. Fischer**, T. Neupert, P. KI. Barkoutsos, and I. Tavernelli,
"Algorithmic Error Mitigation Scheme for Current Quantum Processors",
Quantum **5**, 492 (2021) (arXiv:2008.10914).

44 C. E. Matt, O. Ivashko, M. Horio, D. Sutter, N. Dennler, J. Choi, Q. Wang, **M. H. Fischer**, S. Katrych, L. Forro, J. Ma, B. Fu, B. Lv, M. von Zimmermann, T. K. Kim, N. C. Plumb, N. Xu, M. Shi, and J. Chang,
"Decoupling of lattice and orbital degrees of freedom in an iron-pnictide superconductor"
Phys. Rev. Research **3**, 023220 (2021) (arXiv:1910.01639).

43 E. G. Schertenleib, **M. H. Fischer**, and M. Sigrist,
"Unusual H-T phase diagram of $CeRh_2As_2$ – the role of staggered non-centrosymmetriciy",
Phys. Rev. Research **3**, 023179 (2021) (arXiv:2101.08821).

42 M. Horio, Q. Wang, V. Granata, K. P. Kramer, Y. Sassa, S. Jöhr, D. Sutter, A. Bold, L. Das, Y. Xu, R. Frison, R. Fittipaldi, T. K. Kim, C. Cacho, J. E. Rault, P. Le Fèvre, F. Bertran, N. C. Plumb, M. Shi, A. Vecchione, **M. H. Fischer**, J. Chang,
"Electronic reconstruction forming a C_2-symmetric Dirac semimetal in $Ca_3Ru_2O_7$"
npj Quantum Materials **6**, 29 (2021), (arXiv:1911.12163).

41 Y. Xu, F. Herman, V. Granata, D. Destraz, L. Das, J. Vonka, S. Gerber, J. Spring, M. Gibert A. Schilling, X. Zhang, S. Li, R. Fittipaldi, **M. H. Fischer**, A. Vecchione, and J. Chang,
"Magnetotransport of dirty-limit van Hove singularity quasiparticles",
Communications Physics **4**, 1 (2021) (arXiv:2005.00873).

40 M. M. Denner, **M. H. Fischer**, and T Neupert,
"Efficient Learning of a One-dimensional Density Functional Theory",
Phys. Rev. Research **2**, 033388 (2020) (arXiv:2005.03014).

39 F. Schindler, B. Bradlyn, **M. H. Fischer**, and T. Neupert,
"Pairing Obstructions in Topological Superconductors",
Phys. Rev. Lett. **124**, 247001 (2020) (arXiv:2001.02682).

38 E. Greplova, C. Gold, B. Kratochwil, T. Davatz, T. Pisoni, A. Kurzmann, P. Rickhaus, **M. H. Fischer**, T. Ihn, and S. Huber,
"Fully automated identification of 2D material samples",
Phys. Rev. Applied **13**, 064017 (2020) (arXiv:1911.00066).

37 A. Ribak, R. Majlin Skiff, M. Mograbi, P.K. Rout, **M. H. Fischer**, J. Ruhman, K. Chashka, Y. Dagan, and A. Kanigel,
"Chiral superconductivity in the alternate stacking compound 4Hb-TaS_2",
Science Advances **6**, eaax9480 (2020) (arXiv:1905.02225).

36 A. Skurativska, T. Neupert, and **M. H. Fischer**,
"Atomic limit and inversion-symmetry indicators for topological superconductors"
Phys. Rev. Research **2**, 013064 (2020) (arXiv:1906.11267).

35 B. Zinkl, **M. H. Fischer**, and M. Sigrist,
"Superconducting gap anisotropy and topological singularities due to lattice translational symmetry and their thermodynamic signatures"
Phys. Rev. B **100**, 014519 (2019) (arXiv:1905.03264).

34 F. Herman, J. Buhmann, **M. H. Fischer**, and M. Sigrist,
"Deviation from Fermi-liquid transport behavior in the vicinity of a Van Hove singularity"
Phys. Rev. B **99**, 184107 (2019) (arXiv:1903.04000).

33 J. Choi, O. Ivashko, N. Dennler, D. Aoki, K. von Arx, S. Gerber, O. Gutowski, **M. H. Fischer**, J. Strempfer, M. v. Zimmermann, and J. Chang,
"Pressure-induced rotational symmetry breaking in URu_2Si_2*"*
Phys. Rev. B **98**, 241113 (2018) (arXiv:1901.02494).

32 L. M. Sieberer, M.-T. Rieder, **M. H. Fischer**, I. C. Fulga,
"Statistical periodicity in driven quantum systems: General formalism and application to noisy Floquet topological chains",
Phys. Rev. B **98**, 214301 (2018) (arXiv:1809.03833).

31 **M. H. Fischer**, M. Sigrist, and D. F. Agterberg,
"Superconductivity without inversion and time-reversal symmetry",
Phys. Rev. Lett. **121**, 157003 (2018) (arXiv:1803.06504).

30 M.-T. Rieder, L. M. Sieberer, **M. H. Fischer**, I. C. Fulga,
"Localization counteracts decoherence in noisy Floquet topological chains",
Phys. Rev. Lett. **120**, 216801 (2018) (arXiv:1711.06188).

29 J. Yago Malo, E. P. L. van Nieuwenburg, **M. H. Fischer**, and A. J. Daley,
"Particle statistics and lossy dynamics of ultracold atoms in optical lattices",
Phys. Rev. A **97**, 053614 (2018) (arXiv:1709.03464).

28 E. P. L. van Nieuwenburg, J. Yago Malo, A. J. Daley, and **M. H. Fischer**,
"Dynamics of many-body localization in the presence of particle loss",
Quantum Science and Technology **3**, 01LT02 (2018) (arXiv:1706.00788).

27 M. P. Allan, **M. H. Fischer**, O. Ostojic, and A. Andringa,
"Creating better superconductors by periodic nanopatterning"
SciPost Physics **3**, 010 (2017) (arXiv:1704.06805).

26 P. B. Ndiaye, C. A. Akosa, **M. H. Fischer**, A. Vaezi, E.-A. Kim, and A. Manchon,
"Dirac spin-orbit torques and charge pumping at the surface of topological insulators",
Phys. Rev. B **96**, 014408 (2017) (arXiv:1509.06929).

25 Y.-T. Hsu, A. Vaezi, **M. H. Fischer**, and E.-A. Kim,
"Topological superconductivity in monolayer transition metal dichalcogenides",
Nature Communications **8**, 14985 (2017) (arXiv:1606.00857).

24 H. P. Lüschen, P. Bordia, S. S. Hodgman, M. Schreiber, S. Sarkar, A. J. Daley, **M. H. Fischer**, E. Altman, I. Bloch, and U. Schneider,
"*Signatures of Many-Body Localization in a Controlled Open Quantum System*",
Phys. Rev. X **7**, 011034 (2017) (arXiv:1610.01613).

23 D. E. Shai, **M. H. Fischer**, A. J. Melville, E. J. Monkman, J. W. Harter, D. W. Shen, D. G. Schlom, M. J. Lawler, E.-A. Kim, and K. M. Shen,
"*Observation of semi-localized dispersive states in the strongly correlated electron-doped ferromagnet* $Eu_{1-x}Gd_xO$",
Phys. Rev. B **94**, 195102 (2016) (arXiv:1610.05337).

22 **M. H. Fischer**, M. Maksymenko, and E. Altmann,
"*Dynamics of a Many-Body-Localized System Coupled to a Bath*",
Phys. Rev. Lett. **116**, 160401 (2016) (arXiv:1512.02669).

21 **M. H. Fischer**, A. Vaezi, A. Manchon, and E.-A. Kim,
"Spin-torque generation in topological insulator based heterostructures",
Phys. Rev. B **93**, 125303 (2016) (arXiv:1305.1328).

20 **M. H. Fischer** and E. Berg,
"*Fluctuation and strain effects in a chiral p-wave superconductor*",
Phys. Rev. B **93**, 054501 (2016) (arXiv:1511.05177).

19 M. Schreiber, S. S. Hodgman, P. Bordia, H. P. Lüschen, **M. H. Fischer**, R. Vosk, E. Altman, U. Schneider, and I. Bloch,
"*Observation of many-body localization of interacting fermions in a quasi-random optical lattice*",
Science **349**, 842 (2015) (arXiv:1501.05661).

18 **M. H. Fischer** and J. Goryo,
"*Symmetry and Gap Classification of the non-symmorphic SrPtAs*",
JPSJ **84**, 054705 (2015) (arXiv:1412.6235).

17 M. P. Allan, K. Lee, A. W. Rost, **M. H. Fischer**, F. Massee, K. Kihou, C.-H. Lee, A. Iyo, H. Eisaki, T.-M. Chuang, J. C. Davis, and E.-A. Kim,

"*Identifying the 'fingerprint' of antiferromagnetic spin-fluctuations in iron-pnictide superconductors*",
Nature Physics **11**, 177 (2015) (arXiv:1402.3714).

16 **M. H. Fischer**, S. Wu, M. J. Lawler, A. Paramekanti, and E.-A. Kim,
"*Nematic and spin-charge orders driven by hole-doping a charge-transfer insulator*",
New Journal of Physics **16**, 093057 (2014) (arXiv:1406.2711).

15 A. R. Mellnik, J. S. Lee, A. Richardella, J. L. Grab, P. J. Mintun, **M. H. Fischer**, A. Vaezi, A. Manchon, E.-A. Kim, N. Samarth, and D. C. Ralph,
"*Spin-Transfer Torque Generated by a Topological Insulator*",
Nature **511**, 449-451 (2014) (arXiv:1402.1124),
Featured in 'News and Views'.

14 K. Lee, A. Vaezi, **M. H. Fischer**, and E.-A. Kim,
"*Superconducting proximity effect in topological metals*",
Phys. Rev. B **90**, 214510 (2014) (arXiv:1402.3297).

13 Y.-T. Hsu, **M. H. Fischer**, T. Hughes, K. Park, and E.-A. Kim,
"*Effects of surface-bulk hybridization in 3D topological metals* ",
Phys. Rev. B **89**, 205438 (2014) (arXiv:1401.3378).

12 **M. H. Fischer**, T. Neupert, C. Platt, A. P. Schnyder, W. Hanke, J. Goryo, R. Thomale, and M. Sigrist,
"*Chiral d-wave Superconductivity in SrPtAs*",
Phys. Rev. B **89**, 020509(R) (2014) (arXiv:1311.4909).

11 **M. H. Fischer**,
"*Gap Symmetry and Stability Analysis in the Multi-Orbital Fe-Based Superconductors*",
New Journal of Physics **15**, 073006 (2013) (arXiv:1302.1468).

10 M. P. Allan, A. Tamai, E. Rozbicki, **M. H. Fischer**, J. Voss, P. D. C. King, W. Meevasana, S. Thirupathaiah, E. Rienks, J. Fink, A. Tennant, R. S. Perry, J. F. Mercure, M. A. Wang, C. J. Fennie, E.-A. Kim, M. J. Lawler, K. M. Shen, A. P. Mackenzie, Z.-X. Shen, and F. Baumberger,
"Formation of heavy d-electron quasiparticles in $Sr_3Ru_2O_7$",
New Journal of Physics **15**, 063029 (2013) (arXiv:1210.8382).

9 P. K. Biswas, H. Luetkens, T. Neupert, T. Stürzer, C. Baines, G. Pascua, A. P. Schnyder, **M. H. Fischer**, J. Goryo, M. R. Lees, H. Maeter, F. Brückner, H.-H. Klauss, M. Nicklas, P. J. Baker, A. D. Hiller, M. Sigrist, A. Amato, and D. Johrendt,
"Evidence for superconductivity with broken time-reversal symmetry in locally noncentrosymmetric SrPtAs",
Phys. Rev. B **87**, 180503(R) (2013) (arXiv:1212.2441).

8 K. Lee, **M. H. Fischer**, and E.-A. Kim,
"Signatures of unconventional pairing in near-vortex electronic structure of LiFeAs",
New Journal of Physics **15**, 053048 (2013) (arXiv:1209.0788).

7 **M. H. Fischer**, S. Raghu, and E.-A. Kim,
"Spin-orbit coupling in $LaAlO_3/SrTiO_3$ interfaces: magnetism and orbital order",
New Journal of Physics **15**, 023022 (2013) (arXiv:1206.1060).

6 J. Goryo, **M. H. Fischer**, and M. Sigrist,
"Possible pairing symmetries in SrPtAs with a local lack of inversion center",
Phys. Rev. B **86**, 100507(R) (2012) (arXiv:1208.2541).

5 S. J. Youn, **M. H. Fischer**, S. H. Rhim, M. Sigrist, and D. F. Agterberg,
"Role of strong spin-orbit coupling in the superconductivity of the hexagonal pnictide SrPtAs",
Phys. Rev. B **85**, 220505(R) (2012) (arXiv:1111.5058).

4 **M. H. Fischer**, F. Loder, and M. Sigrist,
"Superconductivity and local noncentrosymmetry in crystal lattices",
Phys. Rev. B **84**, 184533 (2011) (arXiv:1108.4694).

3 **M. H. Fischer** and E.-A. Kim,
"Mean-field analysis of intra-unit-cell order in the Emery model of the CuO_2 plane",
Phys. Rev. B **84**, 144502 (2011) (arXiv:1106.6060).

2 **M. H. Fischer** and M. Sigrist,
"Effect of a staggered spin-orbit coupling on the occurrence of a nematic phase in $Sr_3Ru_2O_7$",
Phys. Rev. B **81**, 064435 (2010) (arXiv:0909.5392).

1 **M. H. Fischer** and M. Sigrist,
"Dimensional crossover in Sr_2RuO_4 within a slave-boson mean-field theory",
Europhys. Lett. **85**, 27011 (2009) (arXiv:0812.3731).

Proceedings

3 M. Sigrist, D. F. Agterberg, **M. H. Fischer**, J. Goryo, F. Floder, S.-H. Rhim, D. Maruyama, Y. Yanase, T. Yoshida, and S. J. Youn,
"Superconductors with Staggered Non-centrosymmetry",
Proceedings of SCES2013,
JPSJ **83**, 061014 (2014).

2 **M. H. Fischer** and M. Sigrist,
"Effects of spin-orbit coupling on the metamagnetic transition in $Sr_3Ru_2O_7$",
Proceedings of the XIV Training Course in the Physics of Strongly Correlated Systems,
AIP Conf. Proc. 1297, pp. 412-416 (2009).

1 **M. H. Fischer** and M. Sigrist,
"Slave-boson mean-field study of the dimensional crossover in Sr_2RuO_4",
Proceedings of the International Conference on Magnetism,
J. Phys.: Conf. Ser. **200** 012034 (2009).