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## Dissertation

**R. Schäfer**
*Magnetic frustration in three dimensions*
Dissertation published via TU Dresden (2022)

## Publication list

[15] D. Vuina, **R. Schäfer**, D. M. Long, A. Chandran
*Probing Hilbert space fragmentation using controlled dephasing*
Phys. Rev. B 112, 134305 (2025)

[14] E. M. Smith, A. Fitterman, **R. Schäfer**, *et al.*
*Two-Peak Heat Capacity Accounts for $R\ln(2)$ Entropy and Ground State Access in the Dipole-Octupole Pyrochlore $Ce_2Hf_2O_7$*
Phys. Rev. Lett. 135, 086702 (2025) — Editor's Suggestion

[13] E. M. Smith, **R. Schäfer**, *et al.*
*Single Crystal Diffuse Neutron Scattering Study of the Dipole-Octupole Quantum Spin Ice Candidate $Ce_2Zr_2O_7$: No Apparent Octupolar Correlations Above T=0.05K*
Phys. Rev. X 15, 021033 (2025)

[12] **R. Schäfer**, and D. J. Luitz
*DanceQ: High-performance library for number conserving bases*
*SciPost Phys. Codebases 48 (2025)*
*DanceQ repository* and *DanceQ documentation*

[11] Z. Lu, **R. Schäfer**, J. N. Hallén, C. R. Laumann
*[111]-strained spin ice: Localization of thermodynamically deconfined monopoles*
Phys. Rev. B 110, 184421 (2024)

[10] D. Yahne, B. Placke, **R. Schäfer**, *et al.*
*Dipolar spin ice regime proximate to an all-in-all-out Néel ground state in the dipolar-octupolar pyrochlore $Ce_2Sn_2O_7$*
Phys. Rev. X 14, 011005 (2024)

[9] J. Beare, E. M. Smith, J. Dudemaine, **R. Schäfer**, *et al.*
*$\mu$SR Study of the Dipole-Octupole Quantum Spin Ice Candidate $Ce_2Zr_2O_7$*
Phys. Rev. B 108, 174411 (2023)

[8] E. M. Smith, J. Dudemaine, B. Placke, **R. Schäfer**, *et al.*
*Quantum Spin Ice Response to a Magnetic Field in the Dipole-Octupole Pyrochlore $Ce_2Zr_2O_7$*
Phys. Rev. B 108, 054438 (2023)

[7] **R. Schäfer**, B. Placke, O. Benton, and R. Moessner
*Abundance of hard-hexagon crystals in the quantum pyrochlore antiferromagnet*
Phys. Rev. Lett. 131, 096702 (2023)

[6] **R. Schäfer**, J. C. Budich, and D. J. Luitz
*Symmetry protected exceptional points of interacting fermions*
Phys. Rev. Research 4, 033181 (2022)

[5] I. Hagymási, **R. Schäfer**, R. Moessner, and D. J. Luitz
*Magnetization process and ordering of the $S = 1/2$ pyrochlore Heisenberg antiferromagnet in a magnetic field*
Phys. Rev. B 106, L060411 (2022)

[4] E. Smith, O. Benton, D. Yahne, B. Placke, **R. Schäfer**, *et al.*
*The case for a $U(1)\pi$ Quantum Spin Liquid Ground State in the Dipole-Octupole Pyrochlore $Ce_2Zr_2O_7$*
Phys. Rev. X 12, 021015 (2022)
— **Featured in** Quantum Science and Technology Collection

[3] I. Hagymási, **R. Schäfer**, R. Moessner, and D. J. Luitz
*Possible Inversion Symmetry Breaking in the $S = 1/2$ Pyrochlore Heisenberg Magnet*
Phys. Rev. Lett. 126, 117204 (2021)

[2] **R. Schäfer**, I. Hagymási, R. Moessner, and D. J. Luitz
*Pyrochlore $S = \frac{1}{2}$ Heisenberg antiferromagnet at finite temperature*
Phys. Rev. B 102, 054408 (2020)

[1] **R. Schäfer**, G. S. Uhrig, and J. Stolze
*Time-crystalline behavior in an engineered spin chain*
Phys. Rev. B 100, 184301 (2019)

## Preprints

[1] **R. Schäfer**, C. Chamon, C. R. Laumann
*Hall-on-Toric: Descendant Laughlin state in the chiral $Z_p$ toric code*
arXiv:2507.02035 (2025)

[2] H. Kim, **R. Schäfer**, D. M. Long, A. Polkovnikov, A. Chandran
**— shared first authorship**
*Confined and deconfined chaos in classical spin systems*
arXiv:2507.07168 (2025)