

List of publications

Publications in peer-reviewed journals

- [17] *Derivation of the Vlasov–Maxwell system from the Maxwell–Schrödinger equations with extended charges*
N. Leopold and C. Saffirio,
accepted for publication in Forum of Mathematics Sigma, Preprint, arXiv:2308.16074.
- [16] *Ground state of Bose gases interacting through singular potentials*
L. Boßmann, N. Leopold, S. Petrat, and S. Rademacher,
J. Funct. Anal. 111268 (2025), DOI: 10.1016/j.jfa.2025.111268, arXiv:2309.12233.
- [15] *Renormalized Bogoliubov Theory for the Nelson Model*
M. Falconi, J. Lampart, N. Leopold, and D. Mitrouskas,
Ann. Inst. H. Poincaré C Anal. Non Linéaire, published online first (2025),
DOI: 10.4171/AIHPC/154, arXiv:2305.06722.
- [14] *A Note on the Binding Energy for Bosons in the Mean-field Limit*
L. Boßmann, N. Leopold, D. Mitrouskas, and S. Petrat,
J. Stat. Phys. **191**, 48 (2024), DOI: 10.1007/s10955-024-03260-5, arXiv:2307.13115.
- [13] *Asymptotic analysis of the weakly interacting Bose gas: A collection of recent results and applications*
L. Boßmann, N. Leopold, D. Mitrouskas, and S. Petrat,
in: Bassi, A., Goldstein, S., Tumulka, R., Zanghì, N. (eds) Physics and the Nature of Reality. Fundamental Theories of Physics 215, Springer, Cham (2024).
DOI: 10.1007/978-3-031-45434-9_22, arXiv:2304.12910.
- [12] *Norm approximation for the Fröhlich dynamics in the mean-field regime*
N. Leopold,
J. Funct. Anal. **285**(4), 109979 (2023), DOI: 10.1016/j.jfa.2023.109979, arXiv:2207.01598.
- [11] *Derivation of the Maxwell–Schrödinger Equations: A note on the infrared sector of the radiation field*
M. Falconi and N. Leopold,
J. Math. Phys. **64**, 011901 (2023), DOI: 10.1063/5.0093786, arXiv:2203.16368.
- [10] *Propagation of moments for large data and semiclassical limit to the relativistic Vlasov equation*
N. Leopold and C. Saffirio,
SIAM J. Math. Anal. **55**(3), 1676–1706 (2023), DOI: 10.1137/22M14936, arXiv:2203.03031.
- [9] *Bogoliubov Dynamics and Higher-order Corrections for the Regularized Nelson Model*
M. Falconi, N. Leopold, D. Mitrouskas, and S. Petrat,
Rev. Math. Phys. **35**(4), 2350006 (2023),
DOI: 10.1142/S0129055X2350006X, arXiv:2110.00458.
- [8] *Landau–Pekar equations and quantum fluctuations for the dynamics of a strongly coupled polaron*
N. Leopold, D. Mitrouskas, S. Rademacher, B. Schlein, and R. Seiringer,
Pure Appl. Anal. **3**(4), 653–676 (2021), DOI: 10.2140/paa.2021.3.653, arXiv:2005.02098.

- [7] *Derivation of the Landau–Pekar equations in a many-body mean-field limit*
N. Leopold, D. Mitrouskas, and R. Seiringer,
Arch. Ration. Mech. Anal. **240**, 383–417 (2021),
DOI: 10.1007/s00205-021-01616-9, arXiv:2001.03993.
- [6] *The Landau–Pekar equations: Adiabatic theorem and accuracy*
N. Leopold, S. Rademacher, B. Schlein, and R. Seiringer,
Anal. PDE **14**(7), 2079–2100 (2021), DOI: 10.2140/apde.2021.14.2079, arXiv:1904.12532.
- [5] *Theory of the Rotating Polaron: Spectrum and Self-Localization*
E. Yakaboylu, B. Midya, A. Deuchert, N. Leopold, and M. Lemesko,
Phys. Rev. B **98**, 224506 (2019), DOI: 10.1103/PhysRevB.98.224506, arXiv:1809.01204.
- [4] *Mean-Field Dynamics for the Nelson Model with Fermions*
N. Leopold and S. Petrat,
Ann. Henri Poincaré **20**, 3471–3508 (2019),
DOI: 10.1007/s00023-019-00828-w, arXiv:1807.06781.
- [3] *Mean-field limits of particles in interaction with quantized radiation fields*
N. Leopold and P. Pickl,
in: D. Cadamuro, M. Duell, W. Dybalski, S. Simonella (eds) Macroscopic Limits of
Quantum Systems, MaLiQS 2017, Springer Proceedings in Mathematics & Statistics 270,
Springer, Cham (2018). DOI: 10.1007/978-3-030-01602-9, arXiv:1806.10843.
- [2] *Derivation of the Maxwell–Schrödinger Equations from the Pauli–Fierz Hamiltonian*
N. Leopold and P. Pickl,
SIAM J. Math. Anal. **52**(5), 4900–4936 (2020),
DOI: 10.1137/19M1307639, arXiv:1609.01545.
- [1] *Derivation of the Time Dependent Gross–Pitaevskii Equation in Two Dimensions*
M. Jeblick, N. Leopold, and P. Pickl,
Commun. Math. Phys. **372**, 1–69 (2019),
DOI: 10.1007/s00220-019-03599-x, arXiv:1608.05326.

Preprints

- [19] *The Semi-Classical Limit from the Dirac Equation with Time-Dependent External Electromagnetic Field to Relativistic Vlasov Equations*
F. Golse, N. Leopold, N.J. Mauser, J. Möller, and C. Saffirio,
Preprint, arXiv:2512.17849.
- [18] *Derivation of the Maxwell–Schrödinger and Vlasov–Maxwell Equations from Non-Relativistic QED*
N. Leopold,
Preprint, arXiv:2411.07085.

Oberwolfach Reports

- [22] *Mini-Workshop: Mathematics of Many-body Fermionic Systems*
N. Leopold, P. T. Nam, and C. Saffirio
Oberwolfach Rep. 49/2023 (2023), DOI: 10.14760/OWR-2023-49.

- [21] *Effective dynamics for the Nelson model with many fermions*
Contribution to the mini-workshop report "Lorentz Gas Dynamics: particle systems and scaling limits" (2019), DOI: 10.4171/OWR/2019/10.
- [20] *Derivation of the Maxwell–Schrödinger Equations from the Pauli–Fierz Hamiltonian*
Contribution to the workshop report "Mathematical Questions and Challenges in Quantum Electrodynamics and its Applications" (2017), DOI: 10.4171/OWR/2017/41.