List of Publications and Preprints

1) J. Fröhlich, M. Griesemer, and B. Schlein. Asymptotic electromagnetic fields in models of quantum-mechanical matter interacting with the quantized radiation field. *Adv. Math.* **164** (2001), no. 2, 349–398.

2) J. Fröhlich, M. Griesemer, and B. Schlein. Asymptotic completeness for Rayleigh scattering. *Ann. Henri Poincaré* **3** (2002), no. 1, 107–170.

3) A. Elgart and B. Schlein. Adiabatic charge transport and the Kubo formula for Landau type Hamiltonians. *Comm. Pure Appl. Math.* **57** (2004), no. 5, 590–615.

4) J. Fröhlich, M. Griesemer, and B. Schlein. Asymptotic completeness for Compton scattering. *Comm. Math. Phys.* **252** (2004), 415–476.

5) A. Elgart, L. Erdős, B. Schlein, and H.-T. Yau. Nonlinear Hartree equation as the mean field limit of weakly coupled fermions. *J. Math. Pures Appl.* (9) **83** (2004), no. 10, 1241–1273.

6) A. Elgart, L. Erdős, B. Schlein, and H.-T. Yau. Gross-Pitaevskii equation as the mean field limit of weakly coupled bosons. *Arch. Ration. Mech. Anal.* **179** (2006), no. 2, 265–283.

7) B. Schlein. Derivation of the Gross-Pitaevskii hierarchy. *Mathematical Physics of Quantum Mechanics, 279–293.* Proceedings of the conference QMath 9, Gien. Lecture Notes in Phys., 690, Springer, Berlin, 2006.

8) L. Erdős, B. Schlein, and H.-T. Yau. Derivation of the Gross-Pitaevskii hierarchy for the dynamics of Bose-Einstein condensate. *Comm. Pure Applied Math.* **59** (2006), no. 12, 1659–1741.

9) A. Elgart and B. Schlein. Mean field dynamics for boson stars. *Comm. Pure Applied Math.* **60** (2007), no. 4, 500–545.

10) C. Albert, L. Ferrari, J. Fröhlich, and B. Schlein. Magnetism and the Weiss exchange field: a theoretical analysis of recent experiments. *J. Statist. Phys.* **125** (2006), no. 1, 77–124.

11) L. Erdős, B. Schlein, and H.-T. Yau. Derivation of the cubic non-linear Schrödinger equation from quantum dynamics of many-body systems. *Invent. Math.* **167** (2007), no. 3, 515–614.

12) J. Fröhlich, M. Griesemer, B. Schlein. Rayleigh scattering at atoms with dynamical nuclei. *Comm. Math. Phys.* **271** (2007), no. 2, 387–430.

13) L. Erdős, B. Schlein, and H.-T. Yau. Derivation of the Gross-Pitaevskii equation for the dynamics of Bose-Einstein condensates. *Ann. of Math. (2)* **172** (2010), no. 1, 291–370.

14) L. Erdős, B. Schlein, and H.-T. Yau. Rigorous derivation of the Gross-Pitaevskii equation. *Phys. Rev. Lett.* **98** (2007), no. 4, 040404.

15) B. Schlein. Dynamics of Bose-Einstein Condensates. *New Trends in Mathematical Physics*. Selected contributions of the XVth International Congress on Mathematical Physics, edited by V. Sidoravicius, Springer Verlag, 2009, 565-589.

16) L. Erdős, B. Schlein, and H.-T. Yau. Semicircle law on short scales and delocalization of eigenvectors for Wigner random matrices. *Ann. Probab.* **37** (2009), no. 3, 815–852.

17) I. Rodnianski and B. Schlein. Quantum fluctuation and rate of convergence towards mean field dynamics. *Comm. Math. Phys.* **291** (2009), no. 1, 31–61.

18) B. Nachtergaele, H. Raz, B. Schlein, and R. Sims. Lieb-Robinson bounds for harmonic and anharmonic lattice systems. *Comm. Math. Phys.* **286** (2009), no. 3, 1073–1098.

19) L. Erdős, B. Schlein, and H.-T. Yau. Rigorous derivation of the Gross-Pitaevskii equation with a large interaction potential. *J. Amer. Math. Soc.* **22** (2009), no. 4, 1099-1156.

20) L. Erdős, B. Schlein, and H.-T. Yau. Local semicircle law and complete delocalization for Wigner random matrices. *Comm. Math. Phys.* **287** (2009), no. 2, 641–655.

21) C. Hainzl and B. Schlein. Stellar collapse in the time dependent Hartree-Fock approximation. *Comm. Math. Phys.* **287** (2009), no. 2, 705-717.

22) L. Erdős and B. Schlein. Quantum dynamics with mean field interactions: a new approach. *J. Statist. Phys.* **134** (2009), no. 5, 859–870.

23) L. Erdős, B. Schlein, and H.-T. Yau. The ground state energy of a low density Bose gas: a second order upper bound. *Phys. Rev. A* **78** (2008), no. 5, 053627.

24) B. Schlein. Derivation of effective evolution equations from microscopic quantum dynamics. *Evolution Equations, CMI Summer School, ETH 2008*. Clay Mathematics Proceedings, **17**, 2013. Edited by D. Ellwood, I. Rodnianski, G. Staffilani, J. Wunsch. 511–572.

25) L. Erdős, A. Michelangeli, and B. Schlein. Dynamical formation of correlations in a Bose-Einstein condensate. *Comm. Math. Phys.* **289** (2009), no. 3, 1171–1210.

26) K. Kirkpatrick, B. Schlein, and G. Staffilani. Derivation of the two dimensional nonlinear Schrodinger equation from many body quantum dynamics. *Amer. J. Math.* **133** (2011), no.1, 91-130.

27) L. Erdős, B. Schlein, and H.-T. Yau. Wegner estimate and level repulsion for Wigner random matrices. *Int. Math. Res. Not. IMRN* **2010**, no. 3, 436–479.

28) L. Erdős, J. A. Ramirez, B. Schlein, and H.-T. Yau. Universality of sine-kernel for Wigner matrices with a small Gaussian perturbation. *Electron. J. Probab.* **15** (2010), no. 18, 526–603.

29) L. Erdős, S. Péché, J. A. Ramirez, B. Schlein, and H.-T. Yau. Bulk universality for Wigner matrices. *Comm. Pure Appl. Math.* **63** (2010), no. 7, 895–925.

30) L. Erdős, J. A. Ramirez, B. Schlein, T. Tao, V. Vu, and H.-T. Yau. Bulk universality for Wigner hermitian matrices with subexponential decay. *Math. Res. Lett.* **17** (2010), no. 4, 667–674.

31) L. Erdős, B. Schlein, and H.-T. Yau. Universality of random matrices and local relaxation flow. *Invent. Math.* **185** (2011), no. 1, 75-119.

32) B. Nachtergaele, B. Schlein, R. Sims, S. Starr, and V. Zagrebnov. On the existence of the dynamics for anharmonic quantum oscillator systems. *Rev. Math. Phys.* **22** (2010), no. 2, 207–231.

33) C. Hainzl, E. Lenzmann, M. Lewin, and B. Schlein. On blowup for time-dependent generalized Hartree-Fock equations. *Ann. Henri Poincaré* **11** (2010), no. 6, 1023–1052.

34) B. Schlein. Derivation of effective evolution equations from many body quantum dynamics. *XVIth International Congress on Mathematical Physics.* World Sci. Publ., Hackensack, NJ, 2010, 406–416.

35) L. Erdős, B. Schlein, H.-T. Yau, J. Yin. The local relaxation flow approach to universality of the local statistics for random matrices. *Ann. Inst. H. Poincaré Probab. Statist.* **48** (2012), no. 1, 1–46.

36) J. Fröhlich, A. Pizzo, B. Schlein. Ionization of atoms by intense laser pulses. *Ann. Henri Poincaré* **11** (2010), no. 7, 1375-1407.

37) A. Michelangeli, B. Schlein. Dynamical description of gravitational collapse. *Comm. Math. Phys.* **311** (2012), no. 3 , 645-687.

38) B. Schlein. Spectral properties of Wigner matrices. *Mathematical Results in Quantum Physics*. Proceedings of the QMath 11 conference. Edited by P. Exner. World Scientific, 2011, 79–94.

39) A. Maltsev, B. Schlein. Average density of states for hermitian Wigner matrices. *Adv. Math.* **228** (2011), 2797-2836.

40) B. Schlein. Effective evolution equations from many body quantum dynamics. *Proceedings of "New Perspectives in Quantum Statistics and Correlations".*

41) L. Chen, J.-O. Lee, B. Schlein. Rate of convergence towards Hartree dynamics. *J. Statist. Phys.* **144** (2011), no. 4, 872-903.

42) A. Maltsev and B. Schlein. A Wegner Estimate for Wigner Matrices. *Entropy and the Quantum II.* Arizona School of Analysis with Applications. R. Sims, D. Ueltschi Editors, American Mathematical Society, 2011, 145-160.

43) B. Schlein. Effective evolution equations in quantum physics. *Journées équations aux dérivées partielles* (2011), Exp. No. 11. Available in electronic form at http://jedp.cedram.org/jedp-bin/feuilleter.

44) G. Ben Arous, K. Kirkpatrik, B. Schlein. A central limit theorem in many-body quantum dynamics. *Comm. Math. Phys.*, **321** (2013), 371-417.

45) C. Hainzl, B. Schlein. Dynamics of Bose-Einstein condensates of fermion pairs in the low density limit of BCS theory. *J. Funct. Anal.* **265** (2013), no. 3, 399-423.

46) C. Cacciapuoti, A. Maltsev, B. Schlein. Local Marchenko-Pastur law at the hard edge of sample covariance matrices. *J. Math. Phys.* **54** (2013), 043302.

47) B. Schlein. Effective equations for quantum dynamics. Contribution to Proceedings of 6-th European Congress of Mathematics, Krakow, July 2012. Preprint arXiv:1208.0185.

48) N. Benedikter, G. de Oliveira, B. Schlein. Quantitative derivation of the Gross-Pitaevskii equation. Preprint arXiv:1208.0373. *Comm. Pure Appl. Math.* **68** (2015), no. 8, 1399-1482.

49) B. Schlein. Quantum dynamics, coherent states and Bogoliubov transformations. *XVII-th International Congress on Mathematical Physics*, World Sci. Publ., pages 197–216.

50) N. Benedikter, M. Porta, B. Schlein. Mean-field Evolution of Fermionic Systems. *Comm. Math. Phys.* **331** (2014), no. 3, 1087–1131.

51) M. Lewin, P. T. Nam, B. Schlein. Fluctuations around Hartree states in the mean-field regime. *Am. J. Math.* **137** (2015), no. 6, 1613–1650.

52) S. Buchholz, C. Saffirio, B. Schlein. Multivariate central limit theorem in quantum dynamics. *J. Stat. Phys.* **154** (2014), no. 1-2, 113–152.

53) C. Cacciapuoti, A. Maltsev, B. Schlein. Bounds on the Stieltjes transform of Wigner matrices. *Prob. Theory Rel. Fields.* **163** (2015), no. 1–2, 1–59.

54) N. Benedikter, M. Porta, B. Schlein. Mean-field dynamics of fermions with relativistic dispersion. *J. Math. Phys.* **55** (2014), no. 2, 021901.

55) R. Frank, B. Schlein. Dynamics of a strongly coupled polaron. *Lett. Math. Phys.* **104** (2014), no. 8, 911–929.

56) N. Benedikter, M. Porta, B. Schlein. Hartree-Fock dynamics for weakly interacting fermions. *Mathematical Results in Quantum Mechanics*. Proceedings of the QMath12 Conference held in Berlin in Sept. 2013. World Scientific, Singapur, 2015.

57) N. Benedikter, V. Jaksic, M. Porta, C. Saffirio, B. Schlein. Mean-field Evolution of Fermionic Mixed States. *Comm. Pure Appl. Math.* **69** (2016), no. 12, 2250–2303.

58) N. Benedikter, M. Porta, B. Schlein. Effective evolution equations from quantum dynamics. *SpringerBriefs in Mathematical Physics*, **7** (2015).

59) N. Benedikter, M. Porta, C. Saffirio, B. Schlein. From the Hartree dynamics to the Vlasov equation. *Arch. Rational Mech. Anal.* **221** (2016), 273-334.

60) R. L. Frank, C. Hainzl, B. Schlein, R. Seiringer. Incompatibility of the time-dependent Bogoliubov-de Gennes and Ginzburg-Landau equations. *Lett. Math. Phys.* **106** (2016), 913–923.

61) C. Boccato, S. Cenatiempo, B. Schlein. Quantum many-body fluctuations around nonlinear Schrödinger dynamics. *Ann. Henri Poincaré* **18** (2017), 113.

62) J. Fröhlich, A. Knowles, B. Schlein, V. Sohinger. Gibbs measures of nonlinear Schrödinger equations as limits of many-body quantum states in dimensions $d \leq 3$. *Comm. Math. Phys.* **356** (2017), no. 3, 883-980.

63) M. Porta, S. Rademacher, C. Saffirio, B. Schlein. Mean field evolution of fermions with Coulomb interaction. *J. Stat. Phys.* **166** (2017), no. 6, 1345-1364.

64) C. Brennecke, B. Schlein. Gross-Pitaevskii dynamics for Bose-Einstein condensates. *Anal. PDE* **12** (2019), no. 6, 1513-1596.

65) C. Boccato, C. Brennecke, S. Cenatiempo, B. Schlein. Complete Bose-Einstein condensation in the Gross-Pitaevskii regime. *Comm. Math. Phys.* **359** (2018), no. 3, 975-1026.

66) J. Fröhlich, A. Knowles, B. Schlein, V. Sohinger. A microscopic derivation of time-dependent correlation functions of the $1D$ cubic nonlinear Schrödinger equation. *Adv. Math.* **353** (2019), 67-115.

67) C. Boccato, C. Brennecke, S. Cenatiempo, B. Schlein. The excitation spectrum of Bose gases interacting through singular potentials. *Jour. EMS* **22** (2020), no. 7, 2331-2403.

68) E. Dietler, S. Rademacher, B. Schlein. From Hartree dynamics to the relativistic Vlasov equation. *Jour. Stat. Phys.* **172** (2018), no. 2, 398-433.

69) C. Brennecke, P.T. Nam, M. Napiorkowski, B. Schlein. Fluctuations of N-particle quantum dynamics around the nonlinear Schrödinger equation. *Ann. Inst. H. Poincaré Anal. Non Lin.* **36** (2019), no. 5, 1201-1235.

70) C. Boccato, C. Brennecke, S. Cenatiempo, B. Schlein. Bogoliubov Theory in the Gross-Pitaevskii Limit. *Acta Math.* **222** (2019), no. 2, 219-335.

71) B. Schlein. Bogoliubov excitation spectrum for Bose-Einstein condensates. Proc. Int. Cong. of Math. - 2018. Rio de Janeiro, Vol. 2 (2655-2672).

72) N. Benedikter, P. T. Nam, M. Porta, B. Schlein, R. Seiringer. Optimal Upper Bound for the Correlation Energy of a Fermi Gas in the Mean-Field Regime. *Comm. Math. Phys.* **374** (2020), 2097-2150.

73) C. Boccato, C. Brennecke, S. Cenatiempo, B. Schlein. Optimal Rate for Bose-Einstein Condensation in the Gross-Pitaevskii Regime. *Comm. Math. Phys.* **376** (2020), 1311-1395.

74) S. Rademacher, B. Schlein. Central limit theorem for Bose-Einstein condensates. *J. Math. Phys.* **60** (2019), no. 7, 071902.

75) N. Leopold, S. Rademacher, B. Schlein, R. Seiringer. The Landau-Pekar equations: Adiabatic theorem and accuracy. *Analysis and PDE* **14** (2021), 2079- 2100.

76) J. Fröhlich, A. Knowles, B. Schlein, V. Sohinger. The mean-field limit of quantum Bose gases at positive temperature. *Jour. AMS*. Published online (2021). DOI: https://doi.org/10.1090/jams/987. Preprint arXiv:2001.01546.

77) J. Fröhlich, A. Knowles, B. Schlein, V. Sohinger. A path-integral analysis of interacting Bose gases and loop gases. *Jour. Stat. Phys.* **180** (2020), 810–831. DOI: https://doi.org/10.1007/s10955-020-02543-x.

78) A. Adhikari, C. Brennecke, B. Schlein. Bose-Einstein condensation beyond the Gross-Pitaevskii regime. *Ann. H. Poincaré* **22** (2021), 1163–1233.

79) N. Leopold, D. Mitrouskas, S. Rademacher, B. Schlein, R. Seiringer. Landau-Pekar equations and quantum fluctuations for the dynamics of a strongly coupled polaron. *Pure and Appl. Analysis* **3** (2021), No. 4, 653–676.

80) N. Benedikter, P. T. Nam, M. Porta, B. Schlein, R. Seiringer. Correlation energy of a weakly interacting Fermi gas. *Inventiones Math.* **225** (2021), no. 3, 885-979. DOI: https://doi.org/10.1007/s00222-021-01041-5.

81) K. Kirkpatrick, S. Rademacher, B. Schlein. A large deviation principle in many-body quantum dynamics. *Ann. Henri Poincaré*. Online First (2021). Preprint arXiv:2010.13754.

82) C. Caraci, S. Cenatiempo, B. Schlein. Bose-Einstein condensation for two dimensional bosons in the Gross-Pitaevskii regime. *J. Stat. Phys.* **183** (2021), no. 3, 39.

83) J. Fröhlich, A. Knowles, B. Schlein, V. Sohinger. Interacting loop ensembles and Bose gases. *Ann. H. Poincaré* **24** (2023), 1439–1503.

84) G. Basti, S. Cenatiempo, B. Schlein. A new second order upper bound for the ground state energy of dilute Bose gases. *Forum of Math., Sigma* **9** (2021), e74. Preprint arXiv:2101.06222. DOI: https://doi.org/10.1017/fms.2021.66.

85) B. Schlein. Bogoliubov theory for many-body quantum systems. *Partial Differential Equations, Spectral Theory, and Mathematical Physics. The Ari Laptev Anniversary Volume*. Edited by P. Exner, R.L. Frank, F. Gesztesy, H. Holden, T. Weidl. EMS Series of Congress Reports. EMS Press, 2021.

86) C. Brennecke, B. Schlein, S. Schraven. Bose-Einstein Condensation with Optimal Rate for Trapped Bosons in the Gross-Pitaevskii Regime. *Math. Phys. An. Geom.* **25** (2022), 12. DOI: https://doi.org/10.1007/s11040-022-09424-7

87) N. Benedikter, P. T. Nam, M. Porta, B. Schlein, R. Seiringer. Bosonization of Fermionic Many-Body Dynamics. *Ann. H. Poincaré* **23** (2022), no. 5, 1725-1764. DOI: https://doi.org/10.1007/s00023-021-01136-y

88) C. Brennecke, M. Caporaletti, B. Schlein. Excitation Spectrum for Bose Gases beyond the Gross-Pitaevskii Regime. *Rev. Math. Phys.* **34** (2022), no. 9, 2250027.

89) N. Benedikter, M. Porta, B. Schlein, R. Seiringer. Correlation energy of a weakly interacting Fermi gas with large interaction potential. *Arch. Rational Mech. Anal.* **247** (2023), art. number 65.

90) C. Brennecke, B. Schlein, S. Schraven. Bogoliubov Theory for Trapped Bosons in the Gross-Pitaevskii Regime. *Ann. Henri Poincaré* **23** (2022), 1583–1658.

91) J. Fröhlich, A. Knowles, B. Schlein, V. Sohinger. The Euclidean φ^4_2 theory as a limit of an interacting Bose gas. *Jour. EMS* **27** (2022), No. 11, 4399–4468.

92) G. Basti, S. Cenatiempo, A. Olgiati, G. Pasqualetti, B. Schlein. Ground state energy of a Bose gas in the Gross-Pitaevskii regime. *J. Math. Phys.* **63** (2022), 041101. DOI: https://doi.org/10.1063/5.0087116.

93) C. Hainzl, B. Schlein, A. Triay. Bogoliubov Theory in the Gross-Pitaevskii Limit: a Simplified Approach. *Forum of Math. Sigma* **10** (2022), e90.

94) B. Schlein. Bose gases in the Gross-Pitaevskii limit: a survey of some rigorous results. *The Physics and Mathematics of Elliott Lieb*, edited by Frank, Laptev, Lewin, Seiringer, Vol. 2, EMS Press, pp. 277-305.

95) G. Basti, S. Cenatiempo, A. Olgiati, G. Pasqualetti, B. Schlein. A second order upper bound for the ground state energy of a hard-sphere gas in the Gross-Pitaevskii regime. *Comm. Math. Phys.* **399** (2023), 1–55.

96) M. Caporaletti, A. Deuchert, B. Schlein. Dynamics of mean-field bosons at positive temperature. *Ann. Inst. H. Poincaré. Anal. Non Lin.* **41** (2024), 995–1054.

97) L. Fresta, M. Porta, B. Schlein. Effective Dynamics of Extended Fermi Gases in the High-Density Regime. *Comm. Math. Phys.* **401** (2023), 1701–1751.

98) C. Caraci, S. Cenatiempo, B. Schlein. The excitation spectrum of two dimensional Bose gases in the Gross-Pitaevskii regime. *Ann. Henri Poincaré* **24** (2023), 2877–2928.

99) G. Basti, S. Cenatiempo, A. Giuliani, A. Olgiati, G. Pasqualetti, B. Schlein. Upper bound for the ground state energy of a dilute Bose gas of hard spheres. *Arch. Rational Mech. Anal.* **248** (2024), art. number 100.

100) Cristina Caraci, Jakob Oldenburg, Benjamin Schlein. Quantum Fluctuations of Many-Body Dynamics around the Gross-Pitaevskii Equation. *Ann. Inst. H. Poincaré, Anal. Non Lin.* **42** (2025), 1313–1374.

101) Cristina Caraci, Alessandro Olgiati, Diane Saint Aubin, Benjamin Schlein. Third order corrections to the ground state energy of a Bose gas in the Gross-Pitaevskii regime. *Comm. Math. Phys.* **406** (2025), art. number 153.

102) Florian Haberberger, Christian Hainzl, Benjamin Schlein, Arnaud Triay. Upper Bound for the Free Energy of Dilute Bose Gases at Low Temperature. Preprint arXiv:2405.03378.

103) Luca Fresta, Marcello Porta, Benjamin Schlein Effective Dynamics of Local Observables for Extended Fermi Gases in the High-Density Regime. *Comm. Math. Phys.* **406** (2025), art. number 247.

104) Morris Brooks, Jakob Oldenburg, Diane Saint Aubin, Benjamin Schlein. Third Order Upper Bound for the Ground State Energy of the Dilute Bose Gas. Preprint arXiv:2506.04153.