

# W. VINCENT LIU'S PUBLICATIONS

## A. Selected Significant Publications

1. W. V. Liu, “Theoretical study of the damping of collective excitations in a Bose-Einstein condensate,” *Phys. Rev. Lett.* **79**, 4056 (1997). cond-mat/9708080. (Web of Science citations as of Feb 2010: **62**)
2. W. V. Liu and F. Wilczek, “Interior gap superfluidity,” *Phys. Rev. Lett.* **90**, 047002 (2003). arXiv: cond-mat/0208052. (Web of Science citations as of Feb 2010: **178**)
3. E. Gubankova, W. V. Liu, F. Wilczek, “Breached pairing superfluidity: Possible realization in QCD,” *Phys. Rev. Lett.* **91**, 032001 (2003). arXiv: hep-ph/0304016. (Web of Science citations as of Feb 2010: **76**)
4. M. M. Forbes, E. Gubankova, W. V. Liu, and F. Wilczek, “Stability criteria for breached pair superfluidity,” *Phys. Rev. Lett.* **94**, 017001 (2005). arXiv: hep-ph/0405059. (Web of Science citations as of Feb 2010: **66**). [Reported in **Phys. Rev. Focus** (January 5, 2005)]
5. M. Lewenstein and W. V. Liu, “Orbital Dance,” a “News & Views” article, *Nature Physics* **7**, 101 (FEB 2011).

## B. Other Publications

6. K. Sun, W. V. Liu, A. Hemmerich, S. Das Sarma, “Topological semimetal in a fermionic optical lattice,” arXiv:1011.4301, accepted by Nature Physics.
7. Z. Zhang, X. Li, W. V. Liu, “Orbital Liquid Crystal Phases of Cold Fermions in Optical Lattices,” arXiv:1105.3387
8. Xiaopeng Li, Erhai Zhao, W. V. Liu, “Effective action approach to the p-band Mott insulator and superfluid transition,” *Phys. Rev.* **A83**, 063626 (2011).
9. P. Hauke, E. Zhao, K. Goyal, I. H. Deutsch, W. V. Liu, M. Lewenstein, “Time-reversal symmetry breaking of fermions in the p-band of an optical lattice,” arXiv:1103.5964.
10. C. Lin, X. Li, W. V. Liu, “ $U(1)\times U(1)/Z_2$  Kosterlitz-Thouless transition of the Larkin-Ovchinnikov phase in an anisotropic two-dimensional system,” *Phys. Rev.* **B83**, 092501 (2011).

11. Z. Zhang, W. V. Liu, “Finite temperature damping of collective modes of a BCS-BEC crossover superfluid,” *Phys. Rev.* **A83**, 023617 (2011).
12. X. Li, W. V. Liu, and C. Lin, “Bose-Einstein supersolid phase for a novel type of momentum dependent interaction,” *Phys. Rev.* **A83**, 021602(R) (2011).
13. Z. Zhang, H.-H. Hung, C. M. Ho, E. Zhao, W. V. Liu, “Modulated pair condensate of p-orbital ultracold fermions,” *Phys. Rev.* **A82**, 033610 (2010)
14. K. Sun, E. Zhao, W. V. Liu, “Topological phases of dipolar particles in elongated Wannier orbitals,” *Phys. Rev. Lett.* **104**, 165303 (2010).
15. C. Lin, E. Zhao, W. V. Liu, “Liquid crystal phases of ultracold dipolar fermions on a lattice,” *Phys. Rev.* **B81**, 045115 (2010). (**Editor’s selection** for the January 2010 issue of Virtual Journal of Atomic Quantum Fluids)
16. E. Zhao and W. V. Liu, “An effective field theory for one-dimensional polarized Fermi gases,” *J. Low Temp. Phys.* **158**, 36 (2010).
17. E. Zhao, X.-W. Guan, W. V. Liu, M. T. Batchelor, M. Oshikawa, “Analytic thermodynamics and thermometry of Gaudin-Yang Fermi gases,” *Phys. Rev. Lett.* **103**, 140404 (2009). (**Editor’s selection** for the October 2009 issue of Virtual Journal of Atomic Quantum Fluids)
18. E. Zhao, W. V. Liu, “Theory of quasi-one dimensional imbalanced Fermi gases,” *Phys. Rev.* **A78**, 063605 (2008).
19. V. M. Stojanovic, C. Wu, W. V. Liu, S. Das Sarma, “Incommensurate superfluidity of bosons in a double-well optical lattice,” *Phys. Rev. Lett.* **101**, 125301 (2008). arXiv:0804.3977
20. E. Zhao, W. V. Liu, “Orbital order in Mott insulators of spinless p-band fermions”, *Phys. Rev. Lett.* **100**, 160403 (2008). arXiv:0801.0589
21. C. Wu, W. V. Liu, J. Moore, S. Das Sarma, “Prediction of quantum stripe ordering in optical lattices”, *Phys. Rev. Lett.* **97**, 190406 (2006). cond-mat/0606743
22. V. M. Stojanovic, W. V. Liu, Y. B. Kim, “Unconventional interaction between vortices in a polarized Fermi gas”, *Annals of Physics* **323**, 989 (2008). On the arxiv: Short version: cond-mat/0611295; long version: arXiv:0710.2522.

23. W. V. Liu, C. Wu, “Atomic matter of non-zero momentum Bose-Einstein condensation and orbital current order,” *Phys. Rev. A* **74**, 013607 (2006). cond-mat/0601432.
24. W. V. Liu, “Effective theory of excitations in a Feshbach resonant superfluid”, *Phys. Rev. Lett.* **96**, 080401 (2006). arXiv: cond-mat/0508139
25. W. V. Liu, “Anomalous quantum mass flow of atoms in p-wave resonance”, *Phys. Rev. A* **72**, 053613 (2005). arXiv: cond-mat/0503622
26. W. V. Liu, F. Wilczek, and P. Zoller, “Spin-Dependent Hubbard Model and a Quantum Phase Transition in Cold Atoms”, *Phys. Rev. A* **70**, 033603 (2004). arXiv: cond-mat/0404478. (Web of Science citations as of Feb 2010: **27**)
27. C. Wu, W. V. Liu, and E. Fradkin, “Competing orders in coupled Luttinger liquids”, *Phys. Rev. B* **68**, 115104 (2003). [arXiv: cond-mat/0206248.] (Web of Science citations as of Feb 2010: **28**)
28. W. V. Liu, F. Wilczek, “Comment on ‘Superfluidity in the interior-gap states’ by Wu–Yip”. arXiv: cond-mat/0304632.
29. W. V. Liu, F. Wilczek, “Spin-orbit ordering, momentum space coexistence, and cuprate superconductivity”, arXiv: cond-mat/0312685.
30. C. Wu and W. V. Liu, “Thermodynamic properties of the d-density wave order in cuprates”, *Phys. Rev. B* **66**, 020511(R) (2002). arXiv: cond-mat/0201120.
31. W. V. Liu and X.-G. Wen, “Spin-disordered superfluid state for spin-1 bosons with fractional spin and statistics”. arXiv: cond-mat/0201187.
32. W. V. Liu and E. Fradkin, “Antiferromagnetic spin ladders effectively coupled by one-dimensional electron liquids”, *Phys. Rev. Lett.* **86**, 1865 (2001). cond-mat/0008394 .
33. W. V. Liu, “New skyrmions in the attractive Hubbard model with broken SO(4) symmetry”, *Phys. Lett. A* **260**, 94 (1999). arXiv: cond-mat/9903355 .
34. W. V. Liu, “Parity breaking and phase transition induced by a magnetic field in superconductors”, *Nucl. Phys. B* **556**, 563 (1999). arXiv: cond-mat/9808134. (Web of Science citations as of Feb 2010: **24**)

35. W. V. Liu, “Effective field theory approach to Bose-Einstein condensation”, *Int. J. Mod. Phys. B* **12**, 2103 (1998) (**invited review** article). cond-mat/9711250
36. W. V. Liu and W. C. Schieve, “Comment on ‘Collective Excitations of a Bose-Einstein Condensate in a Magnetic Trap’ ”, arXiv: cond-mat/9702122.
37. W. V. Liu and W. C. Schieve, “Quantum chaotic attractor in a dissipative system”, *Phys. Rev. Lett.* **78**, 3278 (1997). arXiv: chaos-dyn/9703012 .
38. W. Liu, Y. N. Lu, and E. J. Ding, “Dynamical phase transitions and self-organized criticality in a theoretical spring-block model”, *Phys. Rev. E*, **51**, 1916 (1995).
39. Y. N. Lu, W. Liu, and E. J. Ding, “Hysteresis in a theoretical spring-block model”, *Phys. Rev. Lett.* **72**, 4005 (1994).