BIOGRAPHICAL SKETCH

Contact Information

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Professional Preparation

- A.B. *cum laude* in Physics, Princeton University (1982)
- Ph.D. in Physics, UC Santa Barbara (1986) ; advisor: Prof. J. R. Schrieffer
- James Franck Postdoctoral Fellow, University of Chicago (1986 - 1988)

Employment

- Professor of Physics, UC San Diego (1999 – present)
- Associate Professor of Physics, UC San Diego (1992 – 1999)
- Assistant Professor of Physics, UC San Diego (1988 – 1992)

Visiting Professorships

- Princeton University (2013)
- Stanford University (1996-97)
- Technion (Haifa, Israel) (1995)

Honors and Awards

- Inaugural Recipient, Dresden Physics Prize (2017)
- Fellow of the American Physical Society (2015)
- Lady Davis Fellowship Trust Visiting Professor of Physics, Technion (1995)
- National Science Foundation Presidential Young Investigator (1989)
- Alfred P. Sloan Foundation Fellow (1989)

Service

- Chair line (elected), American Physical Society Division of Condensed Matter Physics (March 2017 – March 2021).
- Member, Solid State Sciences Committee (2007 – 2009), National Academies Board of Physics and Astronomy
- Vice Chair for Education, UCSD Physics Department (2000 – 2003)
- General member, Aspen Center for Physics (1995 – 1999)
- Advisory board member, Boulder School for Condensed Matter and Materials Physics

Bibliography

A. PRIMARY PUBLISHED OR CREATIVE WORK

I. ORIGINAL PEER-REVIEWED WORK

a. *RESEARCH ARTICLES*

1. D. P. Arovas, R. N. Bhatt, and B. Shapiro, "Anisotropic bond percolation in two dimensions," *Physical Review B* **28**, 1433 (1983).

2. D. P. Arovas, J. R. Schrieffer, and F. Wilczek, "Fractional statistics and the quantum Hall effect," *Physical Review Letters* **53**, 722 (1984). Reprinted in *Geometric Phases in Physics*, ed. A. Shapere and F. Wilczek (World Scientific, 1989); also in *Fractional Statistics and Anyon Superconductivity*, ed. F. Wilczek (World Scientific, 1990); also in *The Quantum Hall Effect*, ed. M. Stone (World Scientific, 1992).

3. D. P. Arovas, J. R. Schrieffer, F. Wilczek, and A. Zee, "Statistical mechanics of anyons," *Nuclear Physics* **B251**, 117 (1985). Reprinted in *Geometric Phases in Physics*, ed. A. Shapere and F. Wilczek (World Scientific, 1989); also in *Fractional Statistics and Anyon Superconductivity*, ed. F. Wilczek (World Scientific, 1990).

4. S. Kivelson, C. Kallin, D. P. Arovas, and J. R. Schrieffer, "Cooperative ring exchange theory of the fractional quantum Hall effect," *Physical Review Letters* **56**, 873 (1986).

5. S. Kivelson, C. Kallin, D. P. Arovas, and J. R. Schrieffer, "Cooperative ring exchange and the fractional quantum Hall effect," *Physical Review B* **36**, 1620 (1987).

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7. D. P. Arovas, A. Auerbach, and F. D. M. Haldane, "Extended Heisenberg models of antiferromagnetism: analogies to the fractional quantum Hall effect," *Physical Review Letters* **60**, 531 (1988).

8. S. Kivelson, C. Kallin, D. P. Arovas, and J. R. Schrieffer, "Comment on "Ring exchange and the fractional quantum Hall effect"," *Physical Review B* **37**, 9085 (1988).

9. D. P. Arovas and A. Auerbach, "Functional integral theories of low-dimensional quantum Heisenberg models," *Physical Review B* **38**, 316 (1988); Erratum: *Physical Review B* **40**, 791(E) (1989).

10. A. Auerbach and D. P. Arovas, "Spin dynamics in the square lattice antiferromagnet," *Physical Review Letters* **61**, 617 (1988).

11. D. P. Arovas, "Two exact excited states for the $S = 1$ AKLT chain," *Physics Letters* **A137**, 431 (1989).

12. S. C. Zhang and D. P. Arovas, "Hole motion in an $S = 1$ chain," *Physical Review B* **40**, 2708 (1989).

13. S. M. Girvin and D. P. Arovas, "Hidden topological Oorder in integer quantum spin chains," *Physica Scripta* **T27**, 156 (1989); work presented at the 1988 Nobel Symposium on Physics of Low-Dimensional Systems.

14. P. Leboeuf, J. Kurchan, M. Feingold, and D. P. Arovas, "Phase space localization: topological aspects of quantum chaos," *Physical Review Letters* **65**, 3076 (1990).

15. D. P. Arovas, "Magnons in random $S = 1$ antiferromagnetic chains," *Physical Review B* **43**, 1255 (1991).

16. D. Wei and D. P. Arovas, "Quasienergy distributions in the kicked Harper model," *Physics Letters* **A158**, 469 (1991).

17. I. Affleck, D. P. Arovas, J. B. Marston, and D. Rabson, "SU($2n$) quantum antiferromagnets with exact C-breaking ground states," *Nuclear Physics* **B366**, 467 (1991).

18. P. Leboeuf, J. Kurchan. M. Feingold, and D. P. Arovas, "Topological aspects of quantum chaos," *Chaos* **2**, 1 (1992).

19. V. Kalmeyer, D. Wei, D. P. Arovas, and S. C. Zhang, "Two-dimensional localization in the presence of random flux and the quantum Hall system at even-denominator filling fractions," *Physical Review B* **48**, 11095 (1993).

20. S. C. Zhang and D. P. Arovas, "Effective field theory of electron motion in the presence of random magnetic flux," *Physical Review Letters* **72**, 1886 (1994).

21. D. P. Arovas and S. R. Renn, "Bogoliubov theory of $[m_\uparrow m_\downarrow 0]$ quantum Hall states," *Physical Review B* **50**, 15408-15411 (1994).

22. T. Einarsson, S. L. Sondhi, S. M. Girvin and D. P. Arovas, "Fractional spin for quantum Hall effect quasiparticles," *Nuclear Physics* **B441**, 515 (1995).

23. S. R. Renn and D. P. Arovas, "Nonlinear $I(V)$ characteristics of Luttinger liquids and gated Hall bars," *Physical Review B* **51**, 16832 (1995).

24. F. D. M. Haldane and D. P. Arovas, "Quantized spin currents in two-dimensional chiral magnets," *Physical Review B* **52**, 4223 (1995).

25. C. B. Hanna, D. P. Arovas, K. Mullen, and S. M. Girvin, "Effect of spin degeneracy on scaling in the quantum Hall regime," *Physical Review B* **52**, 5221 (1995).

26. D. P. Arovas and A. Auerbach, "Tetrakis(dimethylamino)ethylene-C_{60}: multicomponent superexchange and Mott–ferromagnetism," *Physical Review B* **52**, 10114 (1995).

27. S. B. Isakov, D. P. Arovas, J. Myrheim, and A. P. Polychronakos, "Thermodynamics for fractional exclusion statistics," *Physics Letters* **A212**, 299 (1996).

28. D. P. Arovas and J. A. Freire, "Dynamical vortices in superfluid films," *Physical Review B* **55**, 1068 (1997).

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30. G. Murthy, D. P. Arovas, and A. Auerbach, "Superfluids and supersolids on frustrated 2d lattices," *Physical Review B* **55**, 3104 (1997).

31. Ji-Min Duan, D. P. Arovas, and L. J. Sham, "Kondo insulator: p-wave bose condensate of excitons," *Physical Review Letters* **79**, 2097 (1997).

32. D. P. Arovas, M. Janssen, and B. Shapiro, "Real-space renormalization of the Chalker-Coddington model," prb 56, 4751, 1997.

33. D. P. Arovas, A. J. Berlinsky, C. Kallin, and S. C. Zhang, "Superconducting vortex with antiferromagnetic core," *Physical Review Letters* **79**, 2871 (1997).

34. J. A. Freire, D. P. Arovas, and H. Levine, "Quantum nucleation of phase slips in a 1d model of a superfluid," *Physical Review Letters* **79**, 5054 (1997).

35. D. P. Arovas and Y. Lyanda-Geller, "Nonabelian Berry phases and transport in doped semiconductors," *Physical Review B* **57**, 12302 (1998).

36. D. P. Arovas and F. Guinea, "Some aspects of the phase diagram of double-exchange systems," prb 58, 9150, 1998.

37. A. J. Berlinsky, G. B. Arnold, D. P. Arovas, M. R. Beasley, E. Demler, C. Kallin, and S. C. Zhang, "Experimental tests of the SO(5) theory of high temperature superconductivity," *Journal of the Physics and Chemistry of Solids* **59**, 1794 (1998).

38. J. A. Freire and D. P. Arovas, "Collapse of a Bose condensate with attractive Interactions", *Phys. Rev. A* **59**, 1461 (1999).

39. A. V. Rozhkov and D. P. Arovas, "Josephson coupling through an Anderson Impurity," *Physical Review Letters* **82**, 2788 (1999).

40. D. P. Arovas, A. Karlhede, and D. Lilliehöök, "SU(N) quantum Hall skyrmions," *Physical Review B* **59**, 13147 (1999).

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55. S. A. Parameswaran, S. L. Sondhi, and D. P. Arovas, "Order and disorder in AKLT antiferromagnets in three dimensions," *Physical Review B* **79**, 024408 (2009).

56. N. H. Lindner, A. Auerbach, and D. P. Arovas, "Vortex dynamics of two dimensional lattice bosons," *Physical Review Letters* **102**, 070403 (2009).

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64. N. H. Lindner, A. Auerbach, and D. P. Arovas, "Vortex dynamics and Hall conductivity of two-dimensional hard core bosons," *Physical Review B* **82**, 134510 (2010).

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66. A. Kumar, W. Escoffier, J.M. Poumirol, C. Faugeras, D. P. Arovas, M. M. Fogler, F. Guinea, S. Roche, M. Goiran, and B. Raquet, "Integer quantum Hall effect in trilayer graphene," *Physical Review Letters* **107**, 126806 (2011).

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70. Z. Huang, T. Das, A. V. Balatsky, and D. P. Arovas, "Stability of Weyl metals under impurity scattering," *Physical Review B* **87**, 155123 (2013).

71. S. A. Parameswaran, A. M. Turner, D. P. Arovas, and A. Vishwanath, "Topological order and absence of band insulators at integer filling in non-symmorphic crystals," *Nature Physics* **9**, 299 (2013).

72. S. Gazit, D. Podolsky, A. Auerbach, and D. P. Arovas, "Dynamics and conductivity near quantum criticality," *Physical Review B* **88**, 235108 (2013).

73. Z. Huang, D. P. Arovas, and A. V. Balatsky, "Impurity scattering in Weyl semimetals and their stability classification," *New Journal of Physics* **15**, 123019 (2013).

74. O. Ofer, L. Marcipar, V. Ravi Chandra, S. Gazit, D. Podolsky, D. P. Arovas, and A. Keren, "Dynamic spin fluctuations at $T \to 0$ in a spin-$\frac{1}{2}$ ferromagnetic kagome lattice," *Physical Review B* **89**, 205116 (2014).

75. Z. Huang and D. P. Arovas, "Topological indices for open and thermal systems via Uhlmann's phase," *Physical Review Letters* **113**, 076407 (2014).

76. R. Thomale, S. Rachel, B. Andrei Bernevig, and D. P. Arovas, "Entanglement analysis of isotropic spin-1 chains," *Journal of Statistical Mechanics*, P07017 (2015).

77. Y. Y. Kiselev, S. A. Parameswaran, and D. P. Arovas, "Order and disorder in SU(N) simplex solid antiferromagnets," *Journal of Statistical Mechanics*, 013105 (2016).

78. C. H. Lee, D. P. Arovas, and R. Thomale, "Band flatness optimization through complex analysis," *Physical Review B* **93**, 155155 (2016).

79. S. Gazit, D. Podolsky, H. Nonne, A. Auerbach, and D. P. Arovas, "Collective modes in a quantum solid," *Physical Review Letters* **117**, 085302 (2016).

80. T. Vojta, J. Crewse, M. Puschmann, D. Arovas, and Y. Kiselev, "Quantum critical behavior of the superfluid-Mott glass transition," *Physical Review B* **94**, 134501 (2016).

81. S. Rachel, I. Goethel, D. P. Arovas, and M. Vojta, "Strain-induced Landau levels in arbitrary dimensions with an exact spectrum," *Physical Review Letters* **119**, 266801 (2016).

82. A. Auerbach and D. P. Arovas, "Nonlinear conductivity and collective charge excitations in the lowest Landau level," *Physical Review Letters* **119**, 016601 (2017).

83. S. A. Diaz, C. J. O. Reichhardt, D. P. Arovas, A. Saxena, and C. Reichhardt, "Fluctuations and noise signatures of driven magnetic skyrmions," *Physical Review B* **96**, 085106 (2017).

84. Z. Huang, W. Zhu, D. P. Arovas, J.-X. Zhu, and A. V. Balatsky, "Invariance of topological indices under Hilbert space truncation," *Physical Review Letters* **120**, 016403 (2018).

85. S. A. Daz, C. Reichhardt, D. P. Arovas, A. Saxena, and C. J. O. Reichhardt, "Avalanches and criticality in driven magnetic systems," *Physical Review Letters* **120**, 117203 (2018).

86. A. A. Patel, J. McGreevy, D. P. Arovas, and S. Sachdev, "Magnetotransport in a model of a disordered strange metal," *Physical Review X* **8**, 021049 (2018).

87. S. Moudgalya, T. Devakul, D. P. Arovas, and S. L. Sondhi, "Extension of the eigenstate thermalization hypothesis to nonequilibrium steady states," *Physical Review B* **100**, 045112 (2019).

88. A. Auerbach and D. P. Arovas, "Hall anomaly and moving vortex charge in layered superconductors," *SciPost Physics* **8**, 061 (2020).

89. W.-T. Kuo, A. A. Akhtar, D. P. Arovas, and Y. You, "Markovian entanglement dynamics under locally scrambled quantum evolution," *Physical Review B* **101**, 224202 (2020).

90. A. Samanta, D. P. Arovas, and A. Auerbach, "Hall coefficient of semimetals," *Physical Review Letters* **126**, 076603 (2021).

II. REVIEW AND INVITED ARTICLES

1. D. P. Arovas, "Mean field theories of the quantum Heisenberg model," *Helv. Phys. Acta* **63** 323, (1990). Invited talk at the Thirteenth Gwatt Workshop (1989).

2. A. Auerbach and D. P. Arovas, "New approaches to the quantum Heisenberg model: Schwinger boson tepresentations," *J. Appl. Phys.* **67**, 5734 (1990). Invited talk at the 1989 Conference on Magnetism and Magnetic Materials.

3. D. Arovas, "Despite noise, fractons remain unmoved", *Journal Club for Condensed Matter*, August 2018.

4. D. Arovas, "Return of the hexatic: a quantum vortex fluid?", *Journal Club for Condensed Matter*, July 2019.

5. D. Arovas, "Quantum eigenstates from classical Gibbs distributions", *Journal Club for Condensed Matter*, October 2020.

6. D. Arovas, G. Boebinger, and N. Bonesteel, "John Robert Schrieffer" (obituary), *Physics Today* **73**, 1, 63 (2020).

7. D. Arovas, M. B. Maple, and P. Kumar, "Harry Suhl" (obituary), *Physics Today* **73**, 12, 62 (2020).

III. BOOK CHAPTERS

1. J. R. Schrieffer and D. P. Arovas, "The Quantum Hall Effect", in *Frontiers and Borderlines in Many Particle Physics* (North-Holland, 1988). Based on lectures presented at the 1987 Enrico Fermi Summer School, Varenna, Italy.

2. D. P. Arovas, "Topics in Fractional Statistics," in *Geometric Phases in Physics*, F. Wilczek, ed. (World Scientific, 1989).

3. A. Auerbach and D. P. Arovas, "Schwinger Boson Mean Field Theory of the Quantum Heisenberg Model," in *Field Theories in Condensed Matter Physics*, ed. Z. Tesanovic (Addison-Wesley, 1990). Based on invited talk at the 1989 Johns Hopkins University Workshop on Field Theories in Condensed Matter.

4. D. P. Arovas, "Fractional Statistics in Quantum Mechanics," in *Quantum Mechanics of Fundamental Systems III*, eds. C. Teitelboim and J. Zanelli (Plenum, 1992). Based on lectures presented at the Third Conference on Quantum Mechanics of Fundamental Systems, Santiago, Chile.

5. D. P. Arovas and S. M. Girvin, "Exact Questions to Some Interesting Answers in Many Body Physics," in *Recent Progress in Many Body Theories*, eds. C. Campbell and E. Krotscheck (Plenum, 1992).

6. A. Auerbach and D. P. Arovas, "Schwinger Boson Approaches to Quantum Antiferromagnetism," in *Introduction to frustrated magnetism*, eds. C. Lacroix, P. Mendels, F. Mila (Springer, 2011).

IV. REFEREED CONFERENCE PROCEEDINGS

1. Z. Tun, W. J. L. Buyers, R. L. Armstrong, E. D. Hallman, and D. P. Arovas, "Symmetry of Spin Waves and Haldane Gap in $CsNiCl_3$," *Journal de Physique* **49**, C8-1431 (1988). Work presented at the 1988 International Conference on Magnetism.

B. EDUCATIONAL MATERIALS

1. Classical Mechanics I
   Physics 200A lecture notes, Fall 2020 (549 pp.)

2. Equilibrium Statistical Physics
   Physics 210A lecture notes, Spring 2018 (529 pp., plus 35 pp. chapter summaries, 182 pp. worked example problems)

3. Nonequilibrium Statistical Physics
   Physics 210B lecture notes, Fall 2018 (224 pp.)

4. Solid State Physics
   Physics 211 lecture notes, Winter 2021 (766 pp.)

5. Nonlinear Dynamics
   Physics 221A lecture notes, Spring 2014 (364 pp.)

6. Group Theory
   Physics 220 lecture notes, Spring 2018 (316 pp.)

C. UNPUBLISHED WORK

1. Z. Huang and D. P. Arovas, "Edge states, entanglement spectra, and Wannier functions in Haldanes hon- eycomb lattice model and its bilayer generalization,". Online at *arXiv: 1205.6266*.