Curriculum Vitae

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I. ACADEMIC DEGREES

1. 1979, B.Sc. Math/Physics, Hebrew University, Israel.
2. 1981, M.Sc., Physics Dept., Weizmann Institute, Israel.
3. 1985, Ph.D., Physics Dept., SUNY at Stony Brook , N.Y.

II. ACADEMIC APPOINTMENTS

1. 2000 – present, Full Professor, Physics Department, Technion, Israel.
2. 2016-2018, Dean, Physics Department, Technion, Israel.
3. 2003-2004, Visiting Professor, Physics Department, Harvard University.
4. 1995–2000, Associate Professor, Physics Department, Technion, Israel.
5. 1997–1998, Visiting Professor, Physics Department, Stanford University, CA.
6. 1990–1994, Senior Lecturer, Physics Department, Technion, Israel.
7. 1988–1993, Assistant Professor, Physics Department, Boston University, MA.
8. 1987–1988, Postdoctoral Fellow, Brookhaven National Laboratory, NY.
9. 1985–1987, Postdoctoral Associate, University of Chicago, IL.

III. RESEARCH INTERESTS

- Strongly Correlated Electron Systems
- Superconductivity and Superfluidity
- Quantum Hall effect
- Quantum Magnetism
- Interactions and Disorder
- Quantum Transport Theory

A. Fellowships and Chair

- Fellow of the Israel Physical Society
- Sydney and Elizabeth Corob Professor of Exact Sciences, 2005 - Present

- Milton and Lillian Edwards Academic Lectureship (Israel), 1991–1995
- Alfred P. Sloan Foundation Fellow (U.S.), 1989–1993

IV. LIST OF PUBLICATIONS

Google scholar: citations = 9924, H-index = 42.

A. Books

1. A. Auerbach, *"Interacting Electrons and Quantum Magnetism"*, (Springer-Verlag, N.Y.). 255 pages.
   A graduate textbook on the theory of strongly correlated electron systems; includes exercises, bibliography and mathematical appendices.

2. A. Auerbach and R. Codor, *"Max The Demon vs Entropy of Doom"*, (Looseline Productions, Inc, 2017), French translation "L'Entropie Fatale" (CNRS, Editions, 2019). Scientific Graphic novel, explaining the Second Law of Thermodynamics, Entropy, and Information through the adventures of maxwell's Demon as a superhero sent to save Earth from environmental disaster. Website: www.maxthedemon.com

V. ARTICLES

1. A. Auerbach and P.B. Allen, "Universal High Temperature Saturation In Phonon And Electron Transport" Phys. Rev. **B29**, 1884-1890, (1984).

2. A. Auerbach, S. Kivelson and D. Nicole, "Path Decomposition Expansion For Multidimensional Tunneling", Phys. Rev. Lett. **53**, 411-414, (1984).

3. F.S. Khan, A. Auerbach and P.B. Allen, "Sound Attenuation In Metals: Reformulation Of Pippard's Theory To Include Microscopic Band Structure And Scattering", Sol. Stat. Comm. **54**, 135-139, (1985).

4. A. Auerbach and S. Kivelson, "The Path Decomposition Expansion And Multidimensional Tunneling", Nucl. Phys. **B257**, [FS14], 799-861 (1985).

5. A. Auerbach and S. Kivelson, "Large Amplitude Quantum Fluctuations And Sub-Gap Optical Absorption In Trans-polyacetylene", Phys. Rev. **B33**, 8171-8185, (1986).

6. Pierre van-Baal and A. Auerbach, "An Analysis Of Transverse Fluctuations In Multidimensional Tunneling", Nucl. Phys. **B275**, [FS17], 93-102 (1986).

7. R. Gomer and A. Auerbach, "The Effect Of Finite Resolution On The Determination Of Diffusion Coefficients By The Field Emission Fluctuation Method", R. Gomer and A. Auerbach, Surf. Science, **167**, 493-497 (1986).

8. A. Auerbach and K. Levin, "Kondo Bosons And The Kondo Lattice: Microscopic Basis For The Heavy Fermi Liquid", Phys. Rev. Lett. **57**, 877-880, (1986).

9. A. Auerbach and K. Levin, "Experimental Evidence For Predicted Universal Behavior In Low Temperature Kondo Lattices", Phys. Rev. **B34**, 3524-3528, (1986).

10. A. Auerbach, K.F. Freed and R. Gomer, "Tunneling In Surface Diffusion", 19th Jerusalem Symposium, Editors: J. Jortner and B. Pullman (Riedel), 281-295.

11. A. Auerbach and K. Levin, "The Anderson Lattice And Universal Properties Of Heavy Fermion Systems" , Cond. Matt. Theories, Vol. 2, Ed.s Vashishta, Kalia and Bishop, Plenum NY, 345-355.

12. A. Auerbach and K. Levin, "The Anderson Lattice And Universal Properties Of Heavy Fermion Systems, "Valence Fluctuations and Heavy Fermions", Ed.s Gupta and Malik, Plenum NY, 495-499.

13. A. Auerbach and K. Levin, "Universal Low Temperature Properties Of Heavy Fermion Systems" (Invited), 31st Ann. Conf. Magnetism and Magnetic Materials, J. Appl. Phys. **61**, 3162-3180 (1987).

14. A. Auerbach, K.F. Freed and R. Gomer, "Anomalous Isotope Dependence Of Hydrogen Diffusion Rates On Tungsten (110) Surfaces: Implication For Lattice Hydrogen Interactions", J. Chem. Phys. **86**, 2356-2370 (1987).

15. A. Auerbach, J.H. Kim, K. Levin and M.R. Norman, "Theory Of Antiferromagnetic Correlations And Neutron Scattering Cross Section in Heavy Fermion Metals", Phys. Rev. Lett. **60**, 623-626, (1988).

16. A. Auerbach and K. Levin, "Theory Of The Coherent Heavy Fermion State", Jap. Jour. Appl. Phys. **26**, 457-461 (1987).

17. D.P. Arovas and A. Auerbach, "Functional integral theories of low dimensional quantum Heisenberg models", Phys. Rev. **B38**, 316-336, (1988).

18. A. Auerbach and D.P. Arovas, "Spin Dynamics In The Square Lattice Antiferromagnet", Phys. Rev. Lett. **61**, 617-620, (1988).

19. Ju H. Kim, K. Levin and A. Auerbach, "Assessment Of Fermi Liquid Properties For The Normal State Of The High Tc Oxides", Phys. Rev. **B39**, 11633-11665 (1989).

20. J.H.Kim, K.Levin, R.Wentzcovitch, and A.Auerbach, "Electron- Phonon Interactions In Copper- Oxides", J.H. Kim, K. Levin, R. Wentzcovich, and A. Auerbach, Phys. Rev. B40, 11378-11385 (1989).

21. J.H.Kim, K.Levin, R.Wentzcovitch, and A.Auerbach, "Electron- Phonon Interactions In Copper- Oxides", J.H. Kim, K. Levin, R. Wentzcovich, and A. Auerbach, Physica C162-164 (1989) 1463-1470.

22. A. Auerbach and D. P. Arovas, "New Approaches To The Quantum Heisenberg Model: Schwinger Boson Representations (Invited)", Jour. Appl. Phys., **67**, 5734-5754 (1990).

23. E. Akkermans, A. Auerbach, J.E. Avron and B. Shapiro, "Relation Between Persistent Currents and the Scattering Matrix", Phys. Rev. Lett. **66**, 76-79 (1991).

24. A. Auerbach and B.E. Larson "Doped Antiferromagnets: The Instability of Homogeneous magnetic phases", Phys. Rev. **B43**, 7800-7835 (1991)

25. A. Auerbach and B.E. Larson "Small Polaron Theory Of Doped Antiferromagnets", Phys. Rev. Lett. **66**, 2262-2265 (1991).

26. A. Auerbach and B.E. Larson, "Holes in the Quantum Antiferromagnet: The Theory of Small Polarons", "High Temperature Superconductivity", Ed. J. Ashkenazi, Plenum 1992, 53-59.

27. A. Auerbach, B.E. Larson and G. N. Murthy, "Landau Level Spin Waves and Skyrmion Energy in the Two Dimensional Heisenberg Antiferromagnet", Phys. Rev. **B43**, 11515-11519 (1991).

28. Kim J.H., Levin K., Wentzcovitch R., Auerbach A., "Electron phonon interactions in high temperature superconductors", Phys. Rev. **B44**, 5148-5165 (1991).

29. B. Keimer, A. Aharony, A. Auerbach, R.J. Birgeneau, A.Cassanho, Y. Endoh, R.W. Erwin, M.A. Kastner and G. Shirane, "Néel Transition and Sublattice Magnetization of Pure and Doped La_2CuO_4", *Phys. Rev.* **B45**, 7430-7436, (1992).

30. A.Auerbach and G.N.Murthy, "Interactions and Pair Binding on Spherical Molecules", Europhys. Letters. **19**, 103-105 (1992).

31. A. Auerbach and G.N. Murthy, "Buckminsterfullerine: Interacting Electrons on a Spherical Molecule", *Phys. Rev.* **B46**, 331-350, (1992).

32. A. Aharony and A. Auerbach, "Multicritical Phase Diagram and Random Fields In Superconducting Bismuthates", Phys. Rev. Lett., **70**, 1874-1877 (1993).

33. M. Raykin and A. Auerbach, "The 1/N Expansion and Spin Correlations in Constrained Wavefunctions", Phys. Rev. B., **47**, 5118-5138 (1993).

34. A. Auerbach, "Spin Tunneling, Berry Phases and Doped Antiferromagnets", Phys. Rev. **B48** 3287-3290 (1993).

35. M. Raykin and A. Auerbach, "The 1/N Expansion and Long Range Anitiferromagnetic order", Phys. Rev. Lett. **70**, 3808-3811 (1993).

36. A. Auerbach, "Vibrations and Berry Phases of Charged Buckminsterfullerene", Phys. Rev. Lett. **72**, 2931-1934 (1994).

37. A. Auerbach, N. Manini, and E. Tosatti, "Electron–Vibron Interactions and Berry Phases in Charged Buckminsterfullerene (Part I)", Phys. Rev. B. 12998-13007 (1994).

38. N. Manini, E. Tosatti, and A. Auerbach, "Electron–Vibron Interactions in Charged Buckminsterfullerene: Pair Energies and Spectra (Part II)", Phys. Rev. B. 13008-13019 (1994).

39. M. Kamal, Z.H. Musslimani, and A. Auerbach, "Enhancement of persistent currents by Hubbard Interactions in Disordered 1D Rings: Avoided Levels Crossings Interpretations", J. Phys. I France, **5** 1487-1499, (1995).

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43. G.N. Murthy, D.P. Arovas, A. Auerbach, "Superfluids and supersolids on frustrated two-dimensional lattices", Phys. Rev. B**55**, 3104-3121 (1997).

44. E. Shimshoni and A. Auerbach, "Quantized Hall insulator: Transverse and Longitudinal transport", Phys. Rev. B**55**, 9817-9823 (1997).

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46. A. Auerbach, "Comparison of tunneling rates for fractional charges and electrons across a quantum Hall strip", Phys. Rev. Lett. **80**, 817-820 (1998).

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51. S-C. Zhang, J-P. Hu, E. Arrigoni, W. Hanke and A. Auerbach, "Projected $SO(5)$ Models", Phys. Rev. **B60**, 13060-13068 (99).

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54. M. Havilio and Assa Auerbach, "Correlations in doped Antiferromagnets", Phys. Rev. B**62**, 324-335 (200).

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57. Ehud Altman and Assa Auerbach , "Plaquette Boson-Fermion Model of Cuprates" , Phys. Rev. **B65**, 104508 (2002).

58. Paula Rojt, Yigal Meir and Assa Auerbach, "Luttinger liquid behavior in tunneling through a quantum dot at zero magnetic field ", Phys. Rev. Lett. **89**, 256401-256403 (2002)

59. Ehud Altman and Assa Auerbach, "Oscillating Superfluidity of Bosons in Optical Lattices", Phys. Rev. Lett. **89**, 250404 -250407(2002)

60. Erez Berg, Ehud Altman and Assa Auerbach, "Singlet Excitations in Pyrochlore: A Study of Quantum Frustration", Phys. Rev. Lett. **90**, 147204-147207, (2003).

61. Ran Budnik and Assa Auerbach, "Low-Energy Singlets in the Heisenberg Antiferromagnet on the Kagome Lattice", Phys. Rev. Lett. **93**, 187205 (2004).

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66. Assa Auerbach, G. Venketeswara Pai, "Nonlinear Current of Strongly Irradiated Quantum Hall Gas", Physical Review B **76**, 205318-205329, (2007).

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69. Yaacov E. Kraus, Assa Auerbach, H.A. Fertig and Steven H. Simon, "Testing For Majorana Zero Modes in a p_x+ip_y Superconductor At High Temperature By Tunneling Spectroscopy", Phys. Rev. Lett. 101, 267002 (2008).

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71. Yaacov E. Kraus, Assa Auerbach, H. A. Fertig, Steven H. Simon "Majorana fermions of a two-dimensional Px+iPy superconductor" Phys. Rev. B 79, 134515 (2009).

72. Alexander Mihlin and Assa Auerbach, "Temperature dependence of the order parameter of cuprate superconductors", Phys. Rev. B80, 134521-8, (2009).

73. Netanel H. Lindner and Assa Auerbach, "Conductivity of hard core bosons: A paradigm of a bad metal", Phys. Rev. B81, 054512-14, (2010).

74. Netanel H. Lindner, Assa Auerbach, Daniel P. Arovas, "Vortex Dynamics and Hall Conductivity of Hard Core Bosons", Phys. Rev. B82, 134510-14, (2010).

75. Marvin Weinstein, Assa Auerbach, V. Ravi Chandra, "Reducing Memory Cost of Exact Diagonalization using Singular Value Decomposition", Phys. Rev. E84, 056701-6, (2011).

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77. Daniel Podolsky, Assa Auerbach, Daniel P. Arovas, "Visibility of the Amplitude (Higgs) Mode in Condensed Matter", Phys. Rev. B84, 174522-17, (2011).

78. Sylvain Capponi, V. Ravi Chandra, Assa Auerbach, Marvin Weinstein, "p6 - Chiral Resonating Valence Bonds in the Kagome Antiferromagnet", Phys. Rev. B 87, 161118(R), (2013).

79. Snir Gazit, Daniel Podolsky, Assa Auerbach, "Fate of the Higgs mode near quantum criticality", Phys. Rev. Lett. 110, 140401 (2013).

80. Snir Gazit, Daniel Podolsky, Assa Auerbach, Daniel P. Arovas, "Dynamics and Conductivity Near Quantum Criticality", Phys. Rev. B. **88**, 235108-23 (2013).

81. Snir Gazit, Daniel Podolsky, and Assa Auerbach, Critical Capacitance and Charge-Vortex Duality Near the Superfluid-to-Insulator Transition, Phys. Rev. Lett. **113**, 240601-05 (2014).

82. Daniel Sherman, Uwe S. Pracht2, Boris Gorshunov, Shachaf Poran, John Jesudasan, Madhavi Chand5, Pratap Raychaudhuri, Mason Swanson, Nandini Trivedi, Assa Auerbach, Marc Scheer, Aviad Frydman and Martin Dressel, "The Higgs mode in disordered superconductors close to a quantum phase transition", Nature Physics (2015).

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