CURRICULUM VITAE

Professor Eli Barkai

Passport: Israeli and British.

Marital status: Married, three children.

Current Address:

Department of Physics
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Academic Employment

2010 Professor, Department of Physics, Bar-Ilan University.

Aug. 2008- Feb. 2009 Visiting scientist, Massachusetts Institute of Technology sabbatical with Prof. Silbey.

2007- Associate Prof. Department of Physics, Bar-Ilan University.

June-Aug. 2005 Visiting Professor, University of Notre Dame.

2004-2007 Senior Lecturer, Department of Physics, Bar-Ilan University.

2002-2005: Assistant Professor, Department of Chemistry and Biochemistry, University of Notre Dame.

1998-2002: Post-doctoral fellow at the School of Chemistry, Massachusetts Institute of Technology with Prof. Silbey.

Higher Education

1995-1998: Ph.D. student, School of Physics and Astronomy, Dept. of Condensed Matter, Tel-Aviv University. Subject of thesis: "Generalized Collision Models Lévy Walk Approach". Degree received *summa cum laude*.

1992-1994: M.Sc. student School of Physics and Astronomy, Dept. of Condensed Matter, Tel-Aviv University. Subject of thesis "From Mechanical Collisions To Brownian Motion", Degree received *summa cum laude*.

1989-1991: B.Sc. in Physics, Tel Aviv University.

Teaching Experience

1. Physics laboratory instructor for first year undergraduates, Tel-Aviv (1993 -1995).
2. Physics 1 (Mechanics) instructor for Chemistry undergraduates, Tel-Aviv (1995-1996).
3. Physics 2 (Electricity and Magnetism) instructor for Chemistry undergraduates, Tel-Aviv (1996).
4. Quantum Mechanics 1 and 2, instructor for Physics undergraduates, Tel-Aviv (1996-7).
5. Physics lab. coordinator for first year undergraduates, Tel-Aviv (1998).
6. Quantum Mechanics for Chemistry graduates, Notre Dame (2002,2003).
7. Statistical Mechanics for Chemistry graduates, Notre Dame (2004).
8. Stochastic Processes in Physics, Graduates Bar-Ilan (2004,2005,2008,11,14,19).
9. Quantum Mechanics 1 and/or 2 for undergraduates, Physics Bar-Ilan (2004,05,06,07,2012-20).
10. Statistical Mechanics and Thermodynamics 1 and/or 2 for Physics under-graduates, Bar-Ilan (2009,10,16,17).
11. Electrodynamics for Physics under-graduates (2011,2012,2013).

Experience and Skills

- Analytical: Modeling, non-linear analysis.
- Computational: Programming, symbolic programming (Mathematica), working in a Unix-environment.
- Managerial: As a reserve captain in the Israeli Defense Forces, I manage a group of 50 people coordinating and establishing working relations with internal and external parties.

- **Scientific referee** for *NSF (USA)*, *Israel Science Foundation*, *US-Israel Binational Science Foundation Phys. Rev. Lett.*, *Phys. Rev.*, *Proceeding of the National Academy of Science USA*, *Single Molecules*, J.of Statistical Physics, *Journal of Physics A: Mathematical and Theoretical*, *Chemical Physics*, *The Journal of Chemical Physics*, *The Journal of Physical Chemistry*, *Journal of Luminescence*, *physica status solidi*, *ChemPhysChem*, *Chemical Physics*, *Biophysical Journal*, *Europhysics Letters*, J. of Computational Physics, *New J. of Physics*, *Physica*, *Molecular Physics*, *Journal of Mathematical Physics*, *Journal of Statistical Mechanics: theory and experiment*, *Journal of the Royal SocietyInterface*, *Chaos*, *Fluctuation and Noise Letters*, *Nuclear Physics A*, *Proceedings of the Royal Society A: Mathematical, Physical and Engineering sciences*, *Chaos, Solitons and Fractals*, *Reports on Progress in Physics*, *Journal of applied mathematics*, *Advances in Mathematical Physics*, *Chinese physics B*, *Advances in water resources*, *Review of Modern Physics*, *Scientific reports*, *Nature Physics*, *Nature communications*, *Le Studium*, *Science advances*, *Communication in Nonlinear Science and Numerical Simulations Journal of Taibah University of Science*.

Current and Pending Support

1. Start up package from Notre Dame university, 300000$ (2002).
2. Petroleum Research Fund, Quantum Jump Approach to Single Molecule Spectroscopy, 35,000$ (2004-5). PRF No. 40694-G6.
3. NSF Career: Theoretical Aspects of Single Molecule Spectroscopy: Control, Tracking, and Unraveling Dynamical Events in the Condensed Phase, 515000$ (2004-2008) Award No. CHE-0344930.
4. Yeshiahu Horowitz Science of Complexity Fellowship (2004-2007).
5. Israel Science Foundation, Photon Statistics From a Single Molecule Source (10/2005-10/2008) 140000$.
6. Joint research conference of the Institute of Advanced Studies (Hebrew University) and the Israel Science Foundation. Anomalous Diffusion and Relaxation: from single molecules to the flight of the Albatross, with I. Eliazar. (45000 $) (2007).
7. Weak Ergodicity Breaking: Theory and Applications, Israel Science Foundation, grant 1239/08 (Oct. 2008-2012) 17400 Shekel (50000 $) per year.
8. Workshop on anomalous diffusion and relaxation Office of Naval Research Global (15000 $) (2008).
9. Bruno Memorial Award (120000 $) (2009).
10. Workshop: Weak Chaos, Infinite Ergodic Theory, and Anomalous Dynamics. Max Planck Institute for complex systems, Dresden (July 2011) with R. Klages, H. Kantz and R. Zweimüller. 15000 euro + 800 person days.

11. Partial support for workshop (see item [10] for details). Office of Naval Research Global (10000 $) (2011).

12. From Lévy fluctuations to ergodicity breaking Israel Science Foundation, grant 376/12 with D. Kessler (Oct. 2012- Oct. 2016) 270000 Shekel (67500 $) per year.

13. Kollman Soref scholarships for postdocs: Nickolay Korabel (2009) Daniela Fromberg (2013) Johannes Schulz (2014) Felix Thiel (2016) roughly 14000 $ each.

14. WE-Heraeus Seminar $22-27$ May 2016: Quantifying complex transport with Lévy walks: from cold atoms to humans and robots S. Denisov, E. Barkai, and P. Hänggi, 33000 Euro

15. Dr. Felix Thiel's grant from Deutsche Forschungsgemeinschaft (DFG) roughly 54000×2 Euro (post-doc salary and expenses) July-$2017-19$ on First Detection Problem in Quantum Physics.

16. Summer School: Stochastic Processes with Applications to Physics and Biophysics. 106860 Shekel (Sept. 2017).

17. WE-Heraeus Seminar 2018: Search and Problem solving by random walks Tamás Kiss, Sergey Denisov and Eli Barkai ($42,500$ Euro).

18. Making sense of non-normalized densities: Infinite Ergodic Theory from $1/f$ noise to cold atoms Israel Science Foundation with David Kessler, $320,000$ Shekel times 4 which is roughly equal to $360,000$ USA dollars. With David Kessler. October 2017 - Sept. 2021.

19. Next step in random walks: Understanding mechanisms behind complex spreading phenomena. A CECAM Workshop in Tel-Aviv with S. Denisov, and M. Urbakh, 2018 (12000 Euro).

20. Sandwich scholarship, funded by the council for higher education, for Dr. Wanli Wang 2019 ($80,000$ Shekel).

21. Sandwich scholarship, funded by the council for higher education, for Zhenbo Ni 2019 under the supervision of David Kessler ($80,000$ Shekel).

22. China-India-Israel scholarship for Wanli Wang 2020 ($90,000$ Shekel).

23. Dr. Marc Hoell's grant from Deutsche Forschungsgemeinschaft (DFG) roughly 55000 Euro (post-doc salary) Jan. $-2020-21$ on Big Jump Principle for Correlated Processes.

24. Infinite Ergodic Theory: Thermodynamics and Transport Israel Science Foundation with David Kessler (2020) submitted.

25. London Mathematical Laboratory fellowship (3000 pounds) [$2020--..$]

Awards and Academic Honors

1. Dean's list of distinguished M.Sc. students, 1994.
2. Receipt of M.Sc. *summa cum laude*.
3. Shenkar scholarship for excellence in graduate studies in, 1995.
4. The Salim and Rachel Bannin scholarship for excellence 1998.
5. Receipt of Ph.D. *summa cum laude*.
6. **Yeshiahu Horowitz Science of Complexity Fellowship** (2004).
7. **Krill prize for excellence in scientific research** selected by the Wolf Foundation (2006).
8. **The Michael Bruno Memorial Award** funded by Yad Hanadiv (2009).
9. **Friedrich Wilhelm Bessel Research Award** selected by the Alexander von Humboldt foundation (2011).
10. Ludwig Maximilians universität Münich Center for Nanoscience publication award (2011).
11. Academic cooperation award Alexander von Humboldt foundation (2018) (roughly 12000 Euro).
12. Best lecturer award, Bar-Ilan Physics Department, (2019).
13. Bar-Ilan Rector's prize for scientific innovation (5000 NIS) (2020).

Research Personnel and Visitors

Yong He (post-doc, research associate), Igor Rozhkuv (post-doc), Gennady Margolin (post-doc), Ren Yongqiang (graduate), Vladimir Protasenko (with Prof. Kuno), Golan Bel (research associate), Tzahi Peleg (graduate), Adi Rebenshtok (graduate,PhD), Stanislav Burov (PhD), Faina Shikerman (graduate), Tzvi Shemer (PhD), Adrian Budini (visitor), Michael Lomholt (visitor), Lior Turgeman (graduate) Nickolay Korabel (post-doc), Weihua Deng (visitor) Shai Carmi (research associate) Guy Milshtain (physics project), Nava Leibovish (graduate,PhD) Roberto Venegeroles (visitor), Andreas Dechant (long term visitor), Shimon Yudovich (undergraduate), Elad Bar (undergraduate) Daniela Froemberg (post-doc), Erez Aghion (graduate, PhD), Lukasz Machura (visitor), Idan Niv (undergraduate), Daniel Yonat (undergraduate), Dan Fishgold (undergraduate), Inbar Savorai (undergraduate), Takuma Akimoto (visitor), Netanel Hazot (graduate), Shalom Tzvi Shafier (graduate), Harel Friedman (graduate), Johannes Schulz (post-doc), John Lapeyre (visitor), Netanel Barel (graduate), Hila Cohen (undergraduate), Dotan Ankri (undergraduate), Ruthi Balter (undergraduate), Anna Bodrova (visitor), Itzhak Fouxon (research associate), Felix Thiel (post-doc), Jun Zhang (long term visitor), Daxing Xiong (long term visitor), Lior Zarfaty (PhD), Mattya Ben-Efraim (undergraduate), Talya Baravi (undergraduate) Adily Goldenzweig (undergraduate), Ittai Mualem (undegraduate),

Peng Yonggang (visitor), Wanli Wang (post-doc), Mario Hidalgo-Soria (PhD), Ruoyo Yin (graduate,PhD), Avihai Didi (graduate), Quancheng Liu (graduate,PhD) Yijun Lu (undergraduate) Marc Hoell (post-doc), Zhenbo Ni (PhD long term visitor), Dror Meidan (graduate) Bijoy Daga (visitor), Aviram Samama (undergraduate).

List of Publications

1. E. Barkai and V. Fleurov, *Simulating Brownian Type of Motion — The Rescaling Velocity Approach vs Langevin Approach* **Phys. Rev. E** *52*, 137, (1995).

2. E. Barkai and V. Fleurov, *Brownian Type of Motion of a Randomly Kicked Particle Far and Close to the Diffusion Limit* **Phys. Rev. E** *52*, 1558, (1995).

3. E. Barkai, R.S. Eisenberg and Z. Schuss, *Bi-Directional Shot Noise in a Singly Occupied Channel* **Phys. Rev. E** *54*, 1161, (1996).

4. E. Barkai and V. Fleurov, *Dissipation and Fluctuation for a Randomly Kicked Particle: Normal and Anomalous Diffusion* **Journal of Chemical Physics** *212*, 69-89, (1996).

5. E. Barkai and J. Klafter, *Crossover From Dispersive to Regular Transport in Biased Maps* **Phys. Rev. Lett.** *79*, 2245, (1997).

6. E. Barkai and V. Fleurov, *Lévy Walks and Generalized Stochastic Collision Models* **Phys. Rev. E.** *56*, 6355, (1997).

7. E. Barkai and J. Klafter, *Chaotic Biased Motion* **Physica A** *249*, 156, (1998).

8. E. Barkai and J. Klafter, *Deterministic Transport in Biased Maps: Crossover From Dispersive to Regular Transport* **Phys. Rev. E.** *57*, 5237, (1998).

9. E. Barkai and V. Fleurov, *Generalized Einstein Relation:- a Stochastic Modeling Approach* **Phys. Rev. E.** *58* 1296, (1998).

10. E. Barkai and J. Klafter, *Anomalous Diffusion in the Strong Scattering Limit - A Lévy Walk Approach* **Lecture Notes in Physics** S. Benkadda and G. M. Zaslavsky Ed. Chaos, Kinetics and Non-linear Dynamics in Fluids and Plasmas (Springer-Verlag, Berlin 1998) 373.

11. E. Barkai and J. Klafter, *Comment on: Sub diffusion and Anomalous Local Viscoelasticity in Actin Networks* **Phys. Rev. Lett.** *81*, 1134, (1998).

12. E. Barkai and V. Fleurov, *Stochastic one Dimensional Lorentz Gas on a Lattice* **Journal of Statistical Physics** *96*, 325 (1999).

13. R. Metzler, E. Barkai, and J. Klafter, *Anomalous Diffusion and Relaxation Close to Thermal Equilibrium: A Fractional Fokker-Planck Equation Approach* **Phys. Rev. Lett.** *82*, 3563 (1999).

14. R. Metzler, E. Barkai and J. Klafter, *Deriving fractional Fokker–Planck equations from a generalized master equation* **Europhys. Lett.** *46* (4) 431 (1999).

15. E. Barkai and R. Silbey *Distribution of Single Molecules Line Widths* **Chem. Phys. Lett.**, *310* 287 (1999).

16. R. Metzler, E. Barkai and J. Klafter, *Anomalous Transport in Disordered Systems Under the Influence of External Fields* **Physica A**, *266*, no.1-4, 343 (1999).

17. E. Barkai, V. Fleurov and J. Klafter *One-dimensional Lévy–Lorentz Gas* **Phys. Rev. E 61** 1164 (2000).

18. E. Barkai and R. Silbey *Distribution of Variances of Single Molecules in a Disordered Lattice* **J. Phys. Chem. B** *104* 342 (2000).

19. E. Barkai, R. Metzler and J. Klafter, *From Continuous Time Random Walks to Fractional Fokker–Planck Equation* **Phys. Rev. E** *61* 132 (2000).

20. E. Barkai and R. Silbey *Fractional Kramers Equation* **J. Phys. Chem. B** *104* 3866 (2000). Part of the special issue "Harvey Scher Festschrift"

21. E. Barkai, R. Silbey and G. Zumofen *Lévy Distribution of Single Molecule Line Shape Cumulants in Glasses* **Phys. Rev. Lett.** *84* 5339 (2000).

22. E. Barkai, R. Silbey and G. Zumofen *Transition from Simple to Complex Behavior of Single Molecule Line Shapes in Disordered Condensed Phase* **J. Chem. Phys.** *113* 5853 (2000).

23. E. Barkai, R. J. Silbey and G. Zumofen *Lévy Statistics for Single Molecule Spectroscopy in Low Temperature Glass* AIP conference proceeding Vol. *553*, **Disordered And Complex Systems**, p. 3, P. Sollich, A. C. C. Coolen, L. P. Hughston and R. F. Streater Editors, (2001).

24. E. Barkai *Fractional Fokker–Planck Equation, Solution and Application* **Phys. Rev. E** *63*, 046118 (2001).

25. E. Barkai, Y. Jung, and R. Silbey *Time-Dependent Fluctuations in Single Molecule Spectroscopy: A Generalized Wiener–Khintchine Approach* **Phys. Rev. Lett.** *87*, 207403 (2001).

26. J. Sung, E. Barkai, R. Silbey, and S. Lee *A Fractional Dynamics Approach to Diffusion-Assisted Reactions in Disordered Media* **Journal of Chemical Physics** *116* 2338 (2002).

27. Y. Jung, E. Barkai and R. Silbey *A Stochastic Theory of Single Molecule Spectroscopy* **Adv. in Chem. Phys** *123* 199 (2002), and cond-mat/0311428.

28. Y. Jung, E. Barkai, and R. Silbey, *Lineshape Theory and Photon Counting Statistics for Blinking Quantum Dots: a Lévy Walk Process* **Chemical Physics** *284* 181 (2002).

29. E. Barkai, *CTRW Pathways to the Fractional Diffusion Equation* , **Chemical Physics** *284* 13 (2002).

30. Y. Jung, E. Barkai, and R. Silbey *Current Status of Single Molecule Spectroscopy: Theoretical Aspects* **J. of Chemical Physics** *117* 10980 (2002).

31. E. Barkai, Y. C. Cheng *Aging Continuous Time Random Walks* **J. of Chemical Physics** *118* 6167 (2003).

32. E. Barkai *Aging in Subdiffusion Generated by a Deterministic Dynamical System* **Phys. Rev. Lett. 90** 104101 (2003).

33. E. Barkai *Stable Equilibrium Based on Lévy Statistics: Stochastic Collision Models Approach* **Phys. Rev. E. Rapid Communication**, **68**, 055104(R) (2003).

34. E. Barkai, A. V. Naumov, Yu. G. Vainer, M. Bauer, L. Kador *Lévy Statistics for Random Single–Molecule Line Shapes in a Glass* **Phys. Rev. Lett. 91** 075502 (2003).

35. E. Barkai, Y. Jung and R. Silbey *Theory of Single Molecule Spectroscopy: Beyond the ensemble Average* **Annual Review of Physical Chemistry 55**, 457 (2004).

36. E. Barkai, A. V. Naumov, Yu. G. Vainer, M. Bauer, L. Kador *Experimental Evidence for Lévy Statistics in Single Molecule Fluorescence in a Low Temperature Glass:- Manifestation of Long Range Interactions.* **J. of Luminescence 107** 21 (2004)

37. E. Barkai *Stable Equilibrium Based on Lévy Statistics: a Linear Boltzmann Equation Approach* **J. of Statistical Mechanics 115** 1537 (2004). see also cond-mat/0303255.

38. G. Margolin, E. Barkai, *Aging Correlation Functions for Blinking Nano-Crystals, and Other On - Off Stochastic Processes* **J. of Chem. Phys 121** 1566 (2004).

39. Y. He, E. Barkai *Influence of Spectral Diffusion on Single-Molecule Photon-Statistics* **Phys. Rev. Lett. 93** 068302 (2004).

40. E. Barkai, G. Margolin *Aging, Non-ergodicity, and Lévy Statistics for Blinking Nano-Crystals* **Israel Journal of Chemistry 44** 353 (2004). Special Issue on Single Molecule Spectroscopy.

41. I. Rozhkov, E. Barkai *Photon Emission From a Single Molecule Source Driven by an RF Field* **Phys. Rev. A 71** 033810 (2005).

42. G. Margolin, E. Barkai *Non-ergodicity of Blinking Nano Crystals and Other Lévy Walk Processes* **Phys. Rev. Letters 94** 080601 (2005).

43. Y. He, E. Barkai *Super and sub-Poissonian Photon Statistics for Single Molecule Spectroscopy* **J. of Chemical Physics 122**, 184703 (2005)

44. I. Rozhkov, E. Barkai *Coherent Destruction of Photon Emission from a Single Molecule Source: A Renormalization Group Approach* **J. of Chem. Phys. 123** 074703 (2005).

45. G. Bel, E. Barkai *Weak Ergodicity Breaking in the Continuous-Time Random Walk* **Phys. Rev. Lett. 94** 240602 (2005).

46. G. Margolin, E. Barkai *Single Molecule Chemical Reaction: Reexamination of the Kramers Approach* **Phys. Rev. E Rapid Communication 72** 025101(R) (2005).

47. Y. G. Vainer, A. V. Naumov, M. Bauer, L. Kador, E. Barkai *Statistical analysis of spectra of single impurity molecules and dynamics of disordered solids: I. Distributions of line-widths, moments, and cumulants* **Optics and Spectroscopy 98** 740-746 (2005)

48. G. Bel, E. Barkai, *Occupation Times and Ergodicity Breaking in Biased Continuous Time Random Walk* **J. Phys.: Condens. Matter** 17 (2005) S4287-S4304.

49. G. Margolin, E. Barkai *Non-ergodicity of a Time Series Obeying Lévy Statistics* **J. of Statistical Physics 122** 137 (2006).

50. G. Margolin, V. Protasenko, M. Kuno, E. Barkai *Power Law Blinking Quantum Dots: Stochastic and Physical Models.* **Advances in Chemical Physics 133** 327 and cond-mat/0506512 (2006).

51. G. Bel, E. Barkai *Random Walk to a Non-ergodic Equilibrium Concept* **Phys. Rev. E 73** 016125 (2006).

52. G. Bel, E. Barkai, *Weak Ergodicity Breaking with Deterministic Dynamics* **Europhysics Letters 74** 15 (2006).

53. Y. He, E. Barkai *Theory of Single Photon Control from a Two Level System Source* **Phys. Rev. A. Rapid Communications 74**, 011803 (2006).

54. E. Barkai *Residence Time Statistics for Normal and Fractional Diffusion in a Force Field* **J. of Statistical Physics 123** 883 (2006).

55. Y. He, E. Barkai *Theory of Photons on Demand From a Single Molecule Source* **Phys. Chem. Chem. Phys. 8** 5056 (2006).

56. G. Margolin, V. Protasenko M. Kuno, and E. Barkai *Photon Counting Statistics For Blinking CdSe-ZnS Quantum Dots: A Lévy Walk Process* **J. of Physical Chemistry B 110** 19053 (2006).

57. E. Barkai, I. Sokolov *On Hilfer's Objection to the Fractional Time Diffusion Equation* **Physica A 373** 231 (2007)

58. S. Burov, E. Barkai, *Occupation Time Statistics in the Quenched Trap Model.* **Phys. Rev. Lett. 98** 250601 (2007).

59. E. Barkai, *Strong Correlations between fluctuations and response in aging transport* **Phys. Rev. E Rapid Communication 75**, 060104(R) (2007).

60. E. Barkai, I. Sokolov *Multi-point Distribution Function for the Continuous Time Random Walk* **J. of Stat. Mech: Theory and Experiment** P08001 (2007).

61. A. Rebenshtok, E. Barkai *Distribution of Time Averaged Observables for Weak Ergodicity Breaking*. **Phys. Rev. Lett. 99**, 210601 (2007).

62. F. Shikerman, E. Barkai *Photon Statistics For Single Molecule Non-Linear Spectroscopy* **Phys. Rev. Lett. 99**, 208302 (2007).

63. F. Shikerman, Y. He, E. Barkai *Photon Statistics for a Two Level System Interacting with a Sequence of Two Laser Pulses* **Physical Review A 77** 063819 (2008).

64. S. Burov, E. Barkai, *Critical Exponent of the Fractional Langevin Equation* **Phys. Rev. Lett. 100** 070601 (2008).

65. A. Rebenshtok, E. Barkai, *Weakly non-Ergodic Statistical Physics* **Journal of Statistical Physics 133** 565 (2008).

66. S. Burov, E. Barkai, *Fractional Langevin Equation: Over-Damped, Under-Damped and Critical Behaviors* **Physical Review E 78** 031112 (2008).

67. Y. He, S. Burov, R. Metzler, E. Barkai *Random Time-Scale Invariant Diffusion and Transport Coefficients* **Physical Review Letters 101**, 058101 (2008). See viewpoint in Igor M. Sokolov, Physics 1, 8 (2008).

68. F. Shikerman, E. Barkai *Probing Dynamics of Single Molecules: Nonlinear Spectroscopy Approach* **J. Chem. Phys. 129** 244702 (2008).

69. W. Deng, E. Barkai *Ergodic Properties of Fractional Brownian-Langevin Motion* **Phys. Rev. E. 79** 011112 (2009).

70. E. Barkai, R. Silbey *Theory of Single File Diffusion in a Force Field* **Phys. Rev. Lett. 102** 050602 (2009).

71. N. Korabel, E. Barkai *Pesin-Type Identity for Intermittent Dynamics with a Zero Lyapunov Exponent* **Phys. Rev. Lett. 102**, 050601 (2009).

72. F. D. Stefani, J. P. Hoogenboom, and E. Barkai *Beyond Quantum Jumps: Blinking Nano-scale Light Emitters* **Physics Today 62** nu. 2, p. 34 (February 2009).

73. R. Metzler, V. Tejedor, J.-H. Jeon, Y. He, W. Deng, S. Burov, E. Barkai. *Analysis of single particle trajectories: from normal to anomalous diffusion* **Acta Phys. Polonica B 40** 1315 (2009).

74. Z. Shemer, E. Barkai *Einstein Relation and Effective Temperature for Systems with Quenched Disorder* **Phys. Rev. E 80**, 031108 (2009).

75. I. Peleg, E. Barkai *Multiplicative Noise Induces Zero Critical Frequency* **Phys. Rev. E Rapid Communications 80**, 030104(R) (2009).

76. I. Bronstein, Y. Israel, E. Kepten, S. Mai, Y. Shav-Tal, E. Barkai, Y. Garini *Transient Anomalous Diffusion of Telomeres in the Nucleus of Mammalian Cells* **Physical Review Letters 103**, 018102 (2009).

77. L. Turgeman, S. Carmi, E. Barkai *Fractional Feynman-Kac Equation for non-Brownian Functionals* **Phys. Rev. Lett. 103**, 190201 (2009).

78. E. Barkai, R. Silbey *Diffusion of Tagged Particle in an Exclusion Process* **Physical Review E** *81*, 041129 (2010).

79. L. Lizana, T. Ambjörnsson, A. Taloni, E. Barkai, M. A. Lomholt *Foundation of fractional Langevin equation: Harmonization of a many-body problem* **Physical Review E 81**, 051118 (2010).

80. N. Korabel, E. Barkai *Separation of Trajectories and its Relation to Entropy for Intermittent Systems With a Zero Lyapunov Exponent* **Physical Review E 82**, 016209 (2010).

81. N. Korabel, E. Barkai *Paradoxes of Subdiffusive Infiltration in Disordered Systems* **Phys. Rev. Lett.** *104*, 170603 (2010).

82. S. Burov, R. Metzler, E. Barkai, *Aging and non-ergodicity beyond the Khinchin theorem* 13228-13233 **Proceedings of the National Academy of Sciences** *107* (2010).

83. S. Carmi, L. Turgeman, E. Barkai *On Distributions of Functionals of Anomalous Diffusion Paths* **Journal of Statistical Physics** *141* 1071 (2010).

84. D. Kessler, E. Barkai *Infinite covariant density for diffusion in logarithmic potentials and optical lattices* **Phys. Rev. Lett.** *105*, 120602 (2010).

85. S. Burov, J.-H Jeon, R. Metzler, E. Barkai *Single Particle Tracking in Systems Showing Anomalous diffusion: the Role of Weak Ergodicity Breaking.* **Physical Chemistry Chemical Physics** themed issue: Single-Molecule Optical Studies of Soft and Complex Matter **13** (5), 1800 - 1812 (2011).

86. J.-H. Jeon, V. Tejedor, S. Burov, E. Barkai, C. Selhuber-Unkel, K. Berg-Sorensen, L. Oddershede, and R. Metzler *In vivo anomalous diffusion and weak ergodicity breaking of lipid granules* **Phys. Rev. Lett. 106**, 048103 (2011).

87. N. Korabel, E. Barkai *Boundary Conditions of Normal and Anomalous Diffusion from Thermal Equilibrium* **Phys. Rev. E 83**, 051113 (2011).

88. N. Korabel, E. Barkai *Anomalous Infiltration* **Journal of Statistical Mechanics** P05022 (2011).

89. S. Burov, E. Barkai *Time transformation for random walks in the quenched trap model* **Phys. Rev. Lett. 106**, 140602 (2011).

90. A. Dechant, E. Lutz, E. Barkai, D. A. Kessler *Solution of the Fokker-Planck equation with a logarithmic potential* **Journal of Statistical Physics 145** 1524 (2011).

91. S. Burov, E. Barkai *Residence time statistics for N renewal processes* **Phys. Rev. Lett. 107** 170601 (2011).

92. S. Carmi, and E. Barkai A fractional Feynman-Kac equation for weak ergodicity breaking **Phys. Rev. E 84** 061104 (2011).

93. A. Dechant, E. Lutz, D. Kessler, E. Barkai *Fluctuations of time averages for Langevin dynamics in a binding force field* **Phys. Rev. Lett. 107**, 240603 (2011).

94. N. Korabel, E. Barkai *Infinite invariant density determines statistics of time averages for weak chaos* **Phys. Rev. Lett. 108**, 060604 (2012).

95. A. Dechant, E. Lutz, D. Kessler, E. Barkai *Superaging correlation function and ergodicity breaking for Brownian motion in logarithmic potentials* **Phys. Rev. E 85**, 051124 (2012).

96. D. A. Kessler, and E. Barkai *Theory of fractional-Lévy kinetics for cold atoms diffusing in optical lattices* **Phys. Rev. Lett. 108**, 230602 (2012).

97. E. Barkai, Y. Garini and R. Metzler *Strange Kinetics of Single Molecules in the Cell* **Physics Today** 65(8), 29 (2012).

98. S. Burov, E. Barkai *Weak subordination breaking for the quenched trap model* **Phys. Rev. E 86** 041137 (2012).

99. J. Schulz, E. Barkai, R. Metzler *Aging effects and population splitting in single particle trajectory averages* **Phys. Rev. Lett. 110**, 020602 (2013).

100. T. Akimoto, E. Barkai *Aging generates regular motions in weakly chaotic systems* **Phys. Rev. E. 87**, 032915 (2013)

101. D. Froemberg, E. Barkai *Time averaged Einstein relation and diffusivites for the Lévy walk* **Phys. Rev. E. Rapid Communication**, **87**, 030104(R) (2013).

102. D. Froemberg and E. Barkai *Random time averaged diffusivities for the Lévy walk* **European Physical Journal B 86**, 331 (2013)

103. M. Niemann, H. Kantz, E. Barkai *Fluctuations of 1/f noise and the low frequency cutoff paradox* **Phys. Rev. Lett. 110**, 140603 (2013) *Editor's suggestion.*

104. J.-H. Jeon, E. Barkai, R. Metzler *Noisy continuous time random walks* **The Journal of Chemical Physics 139**, 121916 (2013) Special issue on Chemical Physics of Biological Systems M. Gruebele and D. Thirumalai guest editors.

105. N. Korabel, and E. Barkai *Numerical estimate of infinite invariant density: application to Pesin-type identity* **J. of Statistical Mechanics: Theory and Experiment** (2013) P08010

106. E. Barkai, Y. Garini, and R. Metzler, *Electrostatic effects in living cells* reply to Bob Eisenberg, in readers forum **Physics Today** July (2013).

107. D. Froemberg and E. Barkai *A no-go theorem for ergodicity and Einstein relations for time averages* **Phys. Rev. E 88**, 024101 (2013).

108. N. Leibovich, E. Barkai *Everlasting effect of initial conditions on single file diffusion* **Phys. Rev. E 88**, 032107 (2013)

109. N. Korabel, and E. Barkai *Distribution of time averages for weakly chaotic systems: the role of the infinite invariant density* **Phys. Rev. E.** *88*, 032114 (2013).

110. A. Rebenshtok, E. Barkai, *Occupation times on a comb with ramified teeth* **Phys. Rev. E. 88**, 052126 (2013).

111. A. Dechant, E. Lutz, D. Kessler, E. Barkai *Scaling Green-Kubo relation and application to three aging systems.* **Physical Review X 4**, 011022 (2014).

112. Johannes H. P. Schulz, E. Barkai, R. Metzler *Aging renewal theory and application to random walks* **Physical Review X 4**, 011028 (2014).

113. A. Rebenshtok, S. Denisov, P. Hänggi, and E. Barkai *Non-normalizable densities in strong anomalous diffusion: beyond the central limit theorem* **Phys. Rev. Letters 112**, 110601 (2014).

114. E. Barkai, E. Aghion, and D. Kessler *From the area under the Bessel excursion to anomalous diffusion of cold atoms* **Physical Review X 4**, 021036 (2014).

115. D. Kessler, S. Medallion, and E. Barkai *The distribution of the area under a Bessel excursion and its moments* **Journal of Statistical Physics 156** 686-706 (2014).

116. R. Metzler, J, H. Jeon, A. G. Cherstvy, and E. Barkai *Anomalous diffusion models and their properties: non-stationarity, non-ergodicity and ageing at the centenary of single particle tracking* invited mini-review for Physical Chemistry Chemical Physics **16** (44), 24128 - 24164 (2014).

117. S. Sadegh, E. Barkai, and D. Krapf $1/f$ *noise for intermittent quantum dots exhibits non-stationarity and critical exponents* **New. J. of Physics 16** (2014) 113054.

118. A. Godec, A. V. Chechkin, E. Barkai, H. Kantz, and R. Metzler *Localization and universal fluctuations in ultraslow diffusion processes* **J. of Physica A Mathematical and Theoretical** 47 (2014) 492002.

119. A. Rebenshtok, S. Denisov, P. Hänggi, and E. Barkai *Infinite densities for Lévy walks* **Phys. Rev. E. 90**, 062135 (2014).

120. D. Froemberg, M. Schmiedeberg, E. Barkai, and V. Zaburdaev *Asymptotic densities of ballistic Lévy walks* **Phys. Rev. E. 91**, 022131 (2015).

121. W. Deng, M. Chen, and E. Barkai *Numerical algorithms for the forward and backward fractional Feynman-Kac equations* **J. of Scientific Computing 62** 718 (2015).

122. N. Hazut, S. Medalion, D. Kessler, and E. Barkai *Fractional Edgeworth expansion: corrections to the Gaussian-Lévy central limit theorem* **Phys. Rev. E. 91**, 52124 (2015).

123. Johannes H. P. Schulz and Eli Barkai *Fluctuations around equilibrium laws in ergodic continuous-time random walks* **Phys. Rev. E. 91**, 062129 (2015).

124. N. Leibovich and E. Barkai, *Aging Wiener-Khinchin Theorem* **Phys. Rev. Lett. 115**, 080602 (2015).

125. E. Barkai, *Universal exploration* **Nature Physics 11** 807 (2015).

126. A. Dechant, D. A. Kessler and E. Barkai *Deviations from Boltzmann-Gibbs equilibrium in confined optical lattices* **Phys. Rev. Lett. 115**, 173006 (2015).

127. Xiaochao Wu, Weihua Deng, and Eli Barkai *Tempered fractional Feynman-Kac equation: Theory and examples* **Phys. Rev. E. 93** 032151 (2016).

128. A. Rebenshtok, S. Denisov, P. Hänggi and E. Barkai *Complementary densities of Lévy walks: typical and rare fluctuations* **Mathematical Modelling of Natural Phenomena** (special issue on anomalous diffusion) Vol. **11**, No. 3, (2016), pp. 76-106

129. M. Niemann, E. Barkai, and H. Kantz *Renewal theory for a system with internal states* **Mathematical Modelling of Natural Phenomena** (special issue on anomalous diffusion) 11 3 (2016) 191-239.

130. S. Medalion, E. Aghion, H. Meirovitch, E. Barkai, and D. A. Kessler *Size distribution of ring polymers* **Scientific Reports** 6, 27661 (2016).

131. A. Dechant, S. T. Shafier, D. A. Kessler, and E. Barkai *Heavy-tailed phase-space distributions beyond Boltzmann-Gibbs: Confined laser-cooled atoms in a nonthermal state* **Phys. Rev. E.** 94, 022151 (2016).

132. N. Leibovich, A. Dechant, E. Lutz, and E. Barkai *Aging Wiener-Khinchin theorem and critical exponents of* $1/f^\beta$ *noise* **Phys. Rev. E. 94**, 052130 (2016).

133. Takuma Akimoto, Eli Barkai, and Keiji Saito *Universal Fluctuations of Single-Particle Diffusivity in Quenched Environment* **Phys. Rev. Lett. 117**, 180602 (2016).

134. V. Zaburdaev, I. Fouxon, S. Denisov, and E. Barkai *Superdiffusive dispersals impart the geometry of underlying random walks* **Phys. Rev. Lett. 117**, 270601 (2016).

135. H. Friedman, D. Kessler, and E. Barkai *Quantum renewal equation for the first detection time of a quantum walk* **J. of Physics A: Mathematical and Theoretical 50** (2017) 04LT01 (8pp).

136. I. Fouxon, V. Zaburdaev, S. Denisov, and E. Barkai *Limit theorems for Lévy walks in d dimensions: rare and bulk fluctuations* **J. of Physics A: Mathematical and Theoretical 50**(2017) 154002 (39pp).

137. Bartlomiej Dybiec, Ewa Gudowska-Nowak, Eli Barkai, Alexander A. Dubkov *Lévy flights versus Lévy walks in bounded domains* **Phys. Rev. E. 95**, 052102 (2017).

138. H. Friedman, D. Kessler, and E. Barkai *Quantum walks: the first detected passage time problem* **Phys. Rev. E. 95**, 032141 (2017). *Highlight of journal, chosen as the Editor's suggestion.*

139. E. Aghion, D. A. Kessler, and E. Barkai *Large-fluctuations for spatial diffusion of cold atoms* **Phys. Rev. Lett. 118**, 260601 (2017).

140. Daxing Xiong, Felix Thiel, and Eli Barkai *Using Hilbert transform and classical chains to simulate quantum walks* **Phys. Rev. E. 96**, 022114 (2017).

141. N. Leibovich and E. Barkai *Conditional* $1/f^{\alpha}$ *noise: from single molecules to macroscopic measurement* **Phys. Rev. E. 96**, 032132 (2017).

142. N. Leibovich, and E. Barkai $1/f^{\beta}$ *noise for scale-invariant processes: How long you wait matters* **EPJ B** (2017) 90: 229. Topical issue dedicated to Continuous Time Random Walk still trendy: Fifty-year history, current state, and outlook - edited by Ryszard Kutner and Jaume Masoliver.

143. P. Meyer, E. Barkai, and H. Kantz *Scale-invariant Green-Kubo relation for time-averaged diffusivity* **Phys. Rev. E. 96**, 062122 (2017).

144. Y. Garini and E. Barkai, Viewpoint on: 3*D Imaging and Hopping Molecules* **Physics** (10), 139 (2017).

145. E. Aghion, D. Kessler, and E. Barkai *Asymptotic densities from the modified Montroll-Weiss equation for coupled CTRWs* **Eur. Phys. J. B** (2018) 91:17 topical issue dedicated to Continuous Time Random Walk still trendy: Fifty-year history, current state, and outlook - edited by Ryszard Kutner and Jaume Masoliver.

146. F. Thiel, E. Barkai, and D. A. Kessler *First detected arrival of a quantum walker on an infinite line* **Phys. Rev. Lett. 120**, 040502 (2018).

149. T. Akimoto, E. Barkai and K. Saito, *Non-self averagings and ergodicity in quenched trap model with finite system size* **Phys. Rev. E 97**, 052143 (2018).

150. F. Thiel, D.A. Kessler and E. Barkai, *Spectral dimension controlling the decay of the quantum first-detection probability* **Phys. Rev. A 97**, 0621015 (2018).

151. Lior Zarfaty, Alexander Peletskyi, Itzhak Fouxon, Sergey Denisov and Eli Barkai *Dispersion of particles in an infinite horizon Lorentz gas* **Phys. Rev. E Rapid Communications 98**, 010101(R) (2018) Editor's Suggestion.

152. W. Wang, J. H. P. Schulz, W. Deng, and E. Barkai *Renewal theory with fat tailed distributed sojourn times: typical versus rare* **Phys. Rev. E 98**, 042139 (2018).

153. E. Aghion, D. A. Kessler, and E. Barkai *From Non-normalizable Boltzmann-Gibbs statistics to infinite-ergodic theory* **Phys. Rev. Lett. 122**, 010601 (2019)

154. N. Leibovich, and E. Barkai *Infinite ergodic theory for Heterogeneous Diffusion Processes* **Phys. Rev. E 99**, 042138 (2019).

155. Alessandro Vezzani, Eli Barkai, and Raffaella Burioni *Single-big-jump Principle in physical modeling* **Phys. Rev. E. 100**, 012108 (2019).

156. Dror Meidan, Eli Barkai, and David Kessler *Running Measurement Protocol for the Quantum First-detection Problem* **Journal of Phys. A: mathemtaical and Theoretical 52** 3454001 (2019).

157. R. Yin, K. Ziegler, F. Thiel, and E. Barkai *Large fluctuations of the first detected quantum return time* **Physical Review Research 1**, 033086 (2019) *Editor's suggestion.*

158. Lior Zarfaty, Alexander Peletskyi, EB, and Sergey Denisov *Infinite horizon billiards: Transport at the border between Gauss and Lévy universality classes* **Phys. Rev. E. 100,** 042140 (2019).

159. W. Wang, A. Vezzani, R. Burioni, and E. Barkai *Transport in disorederd systems: the single big jump approach* **Physical Review Research 1**, 033172 (2019).

160. EB and Stas Burov *Packets of diffusing particles exhibit universal exponential tails* **Physical Review Letters 124**, 060603 (2020).

161. Alessandro Vezzani, Eli Barkai, and Raffaella Burioni *Rare events in generalized Lévy walks and the big jump principle* **Scientific Reports 10**, 2732 (2020).

162. Takuma Akimoto, EB, and Gunter Radons *Infinite invariant density in a semi-Markov process with continuous state variables* **Phys. Rev. E 101**, 052112 (2020).

163. E. Aghion, D. A. Kessler, and E. Barkai *Infinite ergodic theory meets Boltzmann statistics* **Chaos, Solitons and Fractals 138**, 109890 (special issue) (2020)

164. Q. Liu, R. Yin, K. Ziegler, and E. Barkai *Quantum walks: the mean first detected transition time* **Physical Review Research 2**, 033113 (2020).

165. M. Hidalgo-Soria, and E. Barkai *The Hitchhiker model for Laplace diffusion processes in the cell environment* **Physical Review E 102**, 012109 (2020).

166. W. Wang, EB, S. Burov *Large deviations for continuous time random walks* **Entropy 2020**, 22(6), 697. Special issue: *New trends in random walks* Miquel Montero editor.

167. F. Thiel, I. Mualem, D. Kessler and E. Barkai *Uncertainty and symmetry bounds for the total detection probability of quantum walks* **Physical Review Research** 2, 023392, (2020).

168. F. Thiel, D. Kessler, E. Barkai *Quantization of the mean decay time for non-Hermitian quantum systems* **Physical Review A 102**, 02210 (2020).

169. F. Thiel, I. Mualem, D. Meidan, E. Barkai, and D. Kessler *Dark states of quantum search cause imperfect detection* **Physical Review Research 2**, 043107 (2020).

170. Lucianno Defaveri, Celia Anteneodo, D. Kessler, EB *Regularized Boltzmann Gibbs statisitcs for a non-confining field* **Physical Review Research 2**, 043088 (2020)

171. M. Höll, W. Wang, E. Barkai *Extreme value statistics for constrained physical models* **Physical Review E 102**, 042141 (2020).

172. W. Wang, M. Höll, E. Barkai *Large deviations of the ballistic Lévy walk model* **Phys. Rev. E 102**, 052115 (2020).

173. W. Wang, and E. Barkai *Fractional diffusion-advection-asymmetry equation* **Physical Review Letters 125**, 240606 (2020) *Editor's suggestion.*

Journal Impact Factor (IF) from WOS (2009)

Annual Review of Physical Chemistry 14.688, PNAS 9.432, Physical Review Letters 7.180, Journal of Physical Chemistry B 4.189, Physical Chemistry Chemical Physics 4.064, Physics Today 3.674, Journal of Chemical Physics 3.149, Physical Review A 2.908, J. of Statistical Mechanics, Theory and Experiment 2.758, Physical Review E 2.508, Europhysics Letters 2.237, J. of Physics Condensed Matter 2.145, Journal of Statistical Physics 1.621, J. of Luminescence 1.628, Acta Physica Pol. B 0.767.

Unpublished Papers

1. K. Ziegler, E. Barkai, and D. A. Kessler, *The first detection time of a quantum state under random probing* (submitted) arXiv:2012.01763 [quant-ph].

2. Lucianno Defaveri, Celia Anteneodo, David Kessler, EB *Renormalized Boltzmann-Gibbs statistics for thermalization in a non-confining field* (in preparation)

3. M. Hidalgo-Soria, E. Barkai, and S. Burov, *A universality class for a two state diffusing diffusivity system* (in preparation).

4. L. Zarfaty, E. Barkai, and D. A. Kessler *Accurately approximating extreme value statistics* arXiv:2006.13677 [cond-mat.stat-mech] (submitted)

5. F. Thiel, I. Mualem, D. Kessler and E. Barkai *Uncertainty relation between detection probability and energy fluctuations* (in preparation).

6. F. Thiel, I. Mualem, D. Kessler and E. Barkai *Quantum detection probability from repaeted measurements III. Into the Krylov subspace* (in preparation).

7. K. Ziegler, E. Barkai, and D. A. Kessler, *Randomly repeated measurements on quantum systems: Correlations and invarinats of the quantum evolution* (in preparation).

8. Q. Liu, K. Ziegler, D. Kessler and EB *Quantum dynamics under repeated measurements.* (in preparation)

Reply to rejected, i.e. invalid, comments on our works

1. *Reply to comment on Non-Normalizable Densities in Strong Anomalous Diffusion: Beyond the Central Limit Theorem* A. Rebenshtok, S. Denisov, P. Hänggi, and E. Barkai (Goychuk's unfounded comment was posted on cond-mat but was rejected from publication in PRL). arXiv:1502.01749 [cond-mat.stat-mech]

2. *Reply to comment Reply to Comment on Large fluctuations for spatial diffusion of cold atoms"* E. Aghion, D. Kessler, and E. Barkai (Goychuk's comment was posted on cond-mat, but like his previous attempt, it was swiftly rejected from publication in PRL).

Book Editor

1. Theory and Evaluation of Single-Molecule Signals E. Barkai, F. Brown, M. Orrit, H. Yang Editors, World Scientific (2008).

Chapters in Books

1. E. Barkai, *Deterministic Aging* p. 128-134 in Complexity, Metastability, and Nonextensivity edited by C. Beck, G. Benedek, A. Rapisarda and C. Tsallis The Science and Culture Series Physics (World Scientific) (2004).

2. E. Barkai, *Weak Ergodicity Breaking in Single Particle Dynamics* p. 365-391 in Theory and Evaluation of Single-Molecule Signals E. Barkai, F. Brown, Y. Haw and M. Orrit Editors. World Scientific (2008).

3. E. Barkai, *Anomalous Kinetics Leads to Weak Ergodicity Breaking* p. 213-239 in Anomalous Transport: Foundations and Applications by Wiley, VCH (Berlin) R. Klages, G. Radons and I. M.Sokolov Editors (2008).

4. S. Carmi, E. Barkai *Fractional Feynman-Kac equation for anomalous diffusion functionals* in Fractional Dynamics, World Scientific Singapore. R. Metzler, S. C. Lim and J. Klafter Editors (2011).

5. E. Barkai and D. Kessler *Transport and the first passage time problem with applications to cold atoms in optical traps* in First-Passage Phenomena and Their Applications, World Scientific, S. Redner, G. Oshanin and R. Metzler Editors (2014). See also arXiv:1305.0081 [cond-mat.stat-mech].

Conference Organizer

1. Challenges in Chemical Physics: Complex Structures, Anomalous Statistics, Single Molecules, Workshop in honor of Yossi Klafter's 60th birthday Tel Aviv (2006), with Ralf Metzler and Michael Urbakh.

2. Theory, Modeling and Evaluation of Single-Molecule Measurements, Lorentz Center, Leiden (2007), with F. Brown, H. Yang, and M. Orrit.

3. Models of Anomalous Diffusion: From Single Molecules to the Flight of the Albatross Center of Advanced Studies Jerusalem (March 2008), with I. Eliazar, and R. Metzler.

4. Weak Chaos, Infinite Ergodic Theory, and Anomalous Dynamics. Max Planck Institute for complex systems, Dresden (July 2011) with R. Klages, H. Kantz and R. Zweimüller.

5. Quantifying complex transport with Lévy walks: from cold atoms to humans and robots. WE-Heraeus Seminar: (May 2016) with S. Denioov, and P. Hänggi.

6. Stochastic Processes with Applications to Physics and Bio-Physics Summer School in Akko : (Sept. 2017) with Yuval Garini.

7. WE-Heraeus Seminar: Search and Problem solving by random walks (May 2018) with Tamás Kiss and Sergey Denisov.

8. Next step in random walks: Understanding mechanisms behind complex spreading phenomenaCECAM workshop at TAU (Nov. 2018) with Sergey Denisov and Michael Urbakh.

9. Sino-German Bilateral Sympusium. Anomalous and Non-Ergodic Diffusion: Modeling, Theory, Application and Simulation Lanzhou University (2019) main organisers: Ralf Metzler and Weihua Deng.

Advisory Committees, Editorial Boards, Professional Organizations

1. Advisory Committee of International SigmaPhi Conference on Statistical Physics. Orthodox Academy of Crete, Greece (2008), Larnaka Cyprus (2011) Rhodes (2014) Corfu (2017).

2. Scientific committee the seventh International Workshop on Applied Probability IWAP Jerusalem (2012).

3. Steering committee for bi-annual meeting on fractional differentiation and its applications (2012-...).

4. Editorial Board of the International Journal of Statistical Mechanics, Hindawi Publishing Corporation (2013-2015

5. Member of the institute for complex adaptive matter (ICAM consurium) (2013-...).

6. Member of the research council of the Hugo Steinhaus center Wrocklaw Poland (2013-2016).

7. Editorial Board and Associate Editor Chaos, Solitons and Fractals: the interdisciplinary journal of nonlinear science, and nonequilibrium and complex phenomena. Grigolini, Boccaletti, Courbage chief editors (2014-2015).

8. Guest editor, Fractional Dynamics special issue J. Stat. Mech. Theory and Experiment (JSTAT) (2014).

9. Chairperson Statistical Physics Session, Israel Physical Society meeting (2014).

10. Programme committee: International conference Stochastic Modeling of Anomalous Dynamics in Complex Physical and Biological Systems, Wrocklaw (2015).

11. Editorial board Journal of Statistical Mechanics: theory and experiments (2015-....).

12. Advisory Committee of the UPoN Conference series (2017-..).

13. Editorial board of Entropy section statistical physics (2020-..).

14. Editorial board of the soon launched ChemPhysMater (2020-..).

15. Guest editor *Proceeding of the National Academy of Science USA* (2020),

16. London Mathematical Laboratory Fellowship (2020-..).

17. Disciplinary committee for faculty members at Bar-Ilan (2020-..).

Invited Talks and Oral Contributions

1. *Bi-Directional Shot Noise in a Singly Occupied Channel* Annual Mathematical Meeting of Israel's Mathematical Union, Weizmann Institute (1996).

2. *Motion of a Randomly Kicked Particle* VII Symposium on Dynamical Processes in Condensed Molecular Systems, Czech Republic (1996).

3. *Response of Anomalous Diffusion Processes to an External Field* The 20th IUPAP International Conference on Statistical Physics, Statphys 20, Paris, July 20 - 24, (1998)

4. *Distribution of Single Molecule Line Shape Cumulants in Glasses* International conference on Disordered and Complex Systems, London (2000).

5. *The Fractional Fokker–Planck Equation, Theory and Application* Fractal Aspects of Complex Systems FACS 2000, Maceio, Brazil (2000).

6. *Lévy Distribution of Single Molecule Line Shape Cumulants in Glasses* Fractal Aspects of Complex Systems FACS 2000, Maceio, Brazil (2000).

7. *Single Molecule Spectroscopy in Low Temperature Glass* MRS Boston (2000).

8. *Photon Counting Statistics For Single Molecule Spectroscopy* American Chemistry Society Meeting, San-Diego (2001).

9. *Time Dependent Line Shape Fluctuations For Single Molecule Spectroscopy* 7th International Meeting on Hole Burning, Single Molecule, and Related Spectroscopy, Taipei, Taiwan (2001).

10. *Theory of Time Dependent Fluctuations in Single Molecule Spectroscopy*, The 18th Symposium on Chemical Physics, Waterloo, Canada (2002).

11. *Aging Continuous Time Random Walks* AGU 2002 Fall Meeting, San Fransisco (2002).

12 *Theory of Time Dependent Fluctuations in Single Molecule Spectroscopy* The American Chemistry Society 225th National Meeting, New Orleans (2003).

13. *Parameter Distributions of Single Molecule Spectra, and Low temperature Dynamics of Disordered Solids* HBSM Bozeman, Montana (2003).

14. *From Sub-Poissonian photon statistics in two level molecules, to Lévy photon statistics in Blinking quantum dots.* HBSM Bozeman, Montana (2003) (Invited).

15. *Lévy Photon Statistics in Blinking Quantum Dots* International Symposium on Molecular Spectroscopy, Ohio (2003)

16. *Theory of Time Dependent Fluctuations in Single Molecule Spectroscopy* International Symposium on Molecular Spectroscopy, Ohio (2003)

17. *Aging Continuous Time Random Walks and Diffusion Equation* Modern Mathematical/Physical Tools for Subsurface Hydrology, Purdue (2003) (Invited).

18. *L'evy Distribution of Single Molecule Line Shape Cumulants in Glasses* The American Chemistry Society 225th National Meeting, New York NY (2003).

19. *Exact Solution for the Influence of Spectral Diffusion on Single Molecule Photon Statistics* Statphys 22 Bangalore India (2004)

20. *Aging in Subdiffusion Generated by a Deterministic Dynamical* System Statphys 22 Bangalore India (2004).

21. *Single Molecule Line Spectroscopy in Low Temperature Glass* The 49th International Symposium on Optical Science and Technology Denver (2004) (invited).

22. *Aging in Subdiffusion Generated by a Deterministic Dynamical* Complexity, Metastability, and Non-Extensivity Erice Sicily (2004).

23. *Aging in Subdiffusion Generated by a Deterministic Dynamical* Fractional Differentiation and its Application, Bordeaux, (2004).

24. *Sub and Super Photon Statistics for Single Molecule Spectroscopy* Israel Physical Society annual meeting, TECHNION, (2004).

25. *Photon Statistics for Single Molecule Spectroscopy* Israel Chemistry Society annual meeting, Tel-Aviv (2005) (invited).

26. *Sub and Super Photon Statistics for Single Molecule Spectroscopy* Frisno 8, Ein-Bokek (2005) .

27. *Stochastic Ergodicity Breaking* Complexity and Nonextensivity, Kyoto Japan (2005).

28. *Stochastic Ergodicity Breaking in Condensed Phase Spectroscopy* Stochastic Processes and Condensed Phase Spectroscopy, Zurich (2005) (invited).

29. *Ergodicity Breaking in Single Molecule Spectroscopy* Theory for Experimentalists: A Symposium in Celebrating Robert J. Silbey's 65th Birthday Boston (2005) (invited).

30. In Search of a Theory of Complexity, Denton (2005) (invited)

31. Single molecule measurements: Theory and experiment, Telluride Research Workshop, Colorado (2005) (invited)

32. Theory of single photon control from a two level system source, 51st Annual Meeting of the Israel Physical Society, Carmiel (2005).

33. Weak Ergodicity Breaking in blinking quantum dots and other fractal time systems. 51st Annual Meeting of the Israel Physical Society Carmiel (2005).

34. Non-Ergodicity of Blinking Nano Crystals, The Laser Atomic Molecular Physics (LAMP) seminar, Winter College on Quantum and Classical Aspects of Information Optics, the Abdus Salam Centre for Theoretical Physics Trieste Italy (2006).

35. Control of Single Photon on Demand from an Atom Source. LAMP seminar, the Abdus Salam Centre for Theoretical Physics, Trieste Italy (2006).

36. Theory of Single Photon on Demand HBSM2006 Centre Paul Langevin, Aussois France (2006).

37. Weak Ergodicity Breaking in Single Molecule Tracking American Chemical Society single-molecule symposium San-Fransisco (2006) (invited).

38. Weak Ergodicity Breaking in Nonlinear Dynamical System. Wilhelm und Else Heraeus Conference on Anomalous Transport: Experimental Results and Theoretical Challenges Bonn (2006) (invited).

39. Weak Ergodicity Breaking: From CTRW to Blinking Dots. Challenges in Chemical Physics: Complex Structures, Anomalous Statistics, Single Molecules Tel Aviv (2006) (invited).

40 Weak Ergodicity Breaking in Single Molecule Measurements. Theory, Modeling and Evaluation of Single-Molecule Measurements, Lorentz Center, Leiden (2007) (invited).

41 Statistical and Physical Models of Blinking Quantum Dots. Fluorescence Intermittency in molecules, quantum dots and quantum wire, University of Notre Dame, Indiana (2007) (invited).

42 Weak Ergodicity Breaking in the CTRW, StatPhys 23 Genoa Italy (talk delivered by Golan Bel) (2007).

43 Anomalous Diffusion Leads to Weak Ergodicity Breaking. The Fourteenth Applied Probability Society of INFORMS Conference Eindhoven (2007) (invited).

44 20th Marian Smoluchowski Symposium of Statistical Physics, Fundamentals and Applications Zakoppane Poland (2007) (invited).

45 Probing Fast Dynamics of Single Molecules: a Non-linear Spectroscopy Approach. Tel Aviv Symposium on Theoretical Chemistry (2007) (invited).

46 Israel Physics Society Annual Meeting (IPS2007) (invited).

47 International Conference in Statistical Physics, Orthodox Academy of Crete, Sigma Phi 2008 (invited).

48 Statistical Mechanics Symposyum, David Mukamel and Grisha Falkovich organizers Weizmann (2008) (invited).

49 5th International Conference on Unsolved Problems on Noise and Fluctuations in Physics, Biology & High Technology Ecole Normale Superieure de Lyon France, June 26, (2008)

50 Noise in complex systems: From molecular dynamics to stochastic modeling (NCMDSM) Korea Advanced Institute of Science and Technology Daejon, Korea (2008) (invited).

51 New paths for random walks, centro internacional de ciencias A.C. Cuernavaca, Mexico (2009) (invited).

52 Single Molecule Non linear spectroscopy, probing fast dynamics. Telluride conference titled: Single Molecule Dynamics, Colorado (2009) (invited).

53 Weak Ergodicity Breaking and its Relation to Weak Chaos. The XI Latin American Workshop on Nonlinear Phenomena (LAWNP09), Buzios Rio de Janeiro (2009) (invited).

54 Multi-scale dynamics in confining systems, Fall meeting of the Materials Research Society, Boston (2009) (invited).

55 Fractional Feynman-Kac Equation. Workshop: Anomalous Diffusion, Theory and Applications, Wroclaw Poland (2009) (invited).

56 Boston University, Harvard, MIT Students Theory Seminar (2009) (invited).

57 Monthly Common seminar of Statistical Physics and Condensed Matter, Paris (2010) (invited).

58 Photon Statistics for Non linear Spectroscopy. China-Israel Workshop on: dynamics and control of quantum systems Jerusalem (2010) (invited).

59 Development of the Teaching and Research Capacity of Young Academic Staff at Wrocklaw University of Technology Project. A mini course on normal and anomalous stochastic processes, Wrocklaw Poland (2010) (invited).

60 From Random to Quantum walks, the third Black Forest Focus on frontiers in dynamics, Breisach am Rhein Germany (2010) (invited).

61 Single File Diffusion. Statistical Mechanics Day III, David Mukamel and Grisha Falkovich organizers Weizmann (2010) (invited).

62 Weak Ergodicity Breaking, Dynamics Days in Asia Pacific 6 Sydney Australia Mini Syposium organizer + talk (2010) (invited).

63 Diffusion of Tagged Particle in an Exclusion Process Statistical Physics Conference 24 Cairns Australia (2010) (contributed).

64 Synchronization of Clocks at Armageddon Workshop on Archeological dating Meggido Israel (2010) (participation).

65 Reaction Kinetics in Condensed Matter Moscow (2010) (invited).

66 Cargese Workshop on Search and Exploration Corsica (2011) (invited).

67 Workshop: Weak Chaos, Infinite Ergodic Theory, and Anomalous Dynamics. Max Planck Institute for complex systems, Dresden (2011) (invited).

68 Workshop: Waves and quantum fields on fractals. Technion (2011) (invited).

69 Time transformations for random walks in quenched random environment Israel Physics Society Meeting, Technion (2011) (contributed).

70 Strange Kinetics of Single Molecules invited talk in unsolved problems on noise 06 Kolkata (2012) (invited).

71 Fractional Feynamn Kac equation semi-plenary talk in the 5th symposium on fractional differentiation and its application Nanjing (2012) (invited).

72 Non ergodic fluctuations on the nano-scale, Nanosciences: Soft, solid, alive and kicking CeNS Workshop Venice (2012) (invited).

73 Venice meeting on fluctuations in small complex systems, Venice (2012) (invited).

74 Classical and quantum transport in complex networks. Blumen and Mulken organizers, Bad Honnef Germnay (2013) (invited).

75 The Kavli Institute for Theoretical Physics China, Small systems nonequilibrium fluctuations workshop, Andrea Puglisi organizer Beijing (2013) (Key participant).

76 Theory of fractional-Lévy kinetics for cold atoms diffusing in optical lattices. Statistical Mechanics Symposyum, David Mukamel and Grisha Falkovich organizers Weizmann (2013) (invited).

77 Diffusion Fundamentals V conference. Cichos, Kroy, Karger, Kramer organizers Universitat Leipzig (2013) (invited).

78 Synergetic Approaches to Complexity, A symposium in memory of Rudolf Freidrich. Haken, Peinke, Radons organizers Dresden (2013) (invited).

79 Fractional-Levy diffsion of cold atoms in optical lattices. Stochasticity symposium, Potsdam-BIU-TAU meeting Diamant, Metzler organizers Tel Aviv (2013) (invited).

80 Weak Chaos and Weak Turbulence, Kartashova, Pikovsky, Shepelyansky organizers, Max Planck Institute Dresden (2014) (contributed).

81 Kinetically-constrained models, bootstrap percolation, mixed order phase transitions, and large deviations, Toninelli, Biroli, Mukamel, Shokef Organizers Tel Aviv (2014) (invited).

82 Indo-Israeli meeting on Frontiers in Condensed Matter Physics, Shimshoni, Klein organizers, Jerusalem (2014) (invited).

83 Venice meeting on fluctuations in small complex systems II, Franosch, Metzler, Oshanin, Sena, Stella, Vattulainen organizers, Venice (2014) (invited).

84 Majorana conference: Single file dynamics in biophysics and related fields and extensions in higher dimensions Taloni and Flomenbom organizers, Erice (2014) (invited).

85 Friction and interface dynamics at the nano and mesoscales, Alava, Bechinger, Urbakh and Vanossi organizers Tel-Aviv (2014) (invited).

86 Frontiers in Non-equilibrium Physics 2015, Hayakawa, Saito and Sagawa organizers Kyoto (2015) (invited).

87 Non standard transport: from anomalous diffusion to reaction spreading in heterogeneous systems, 4 hour mini-course on anomalous transport, Cencini, Serva, Vergni, and Vulpiani organizers, Gran Sasso Science Institute, L'Aquila (2015) (invited).

88 Stochastic Modeling of Anomalous Dynamics in Complex Physical and Biological Systems Wroclaw (2015) (invited).

89 Random walks and nonlinear dynamcis in the life of cells Max Planck Institute for complex systems, Denisov, Manning, Zaburdaev coordinators, Dresden (2015) (invited).

90 Anomalous Diffusion: wild and bad? Metzler, Oshanin, Sokolov Organizers, Bad Wild-bad Black Forest (2015) (invited).

91 Workshop Anomalous dynamics in biological systems, Korea Institute of Advanced Studies (Kias) Seol, Jae-Hyung Jeon organizer (2015) (invited).

92 Fismat 2015 Italian National Conference on Condensed Matter Physics Palermo (2015) (invited).

93 Stochasticity of cells and genes, Roichman, Shokef and Metzler organizers, Tel Aviv (2015) (invited).

94 Statistical Mechanics Symposyum, David Mukamel and Grisha Falkovich organizers Weizmann (2015) Infinite densities for bi-fractal diffusion (invited).

95 Stochastic Modelling of Transport Processes in Biology, Fedotov, Korabel orgnizers, Manchester (2016) (invited).

96 Fluctuations in small complex systems 3, Metzler, Oshanin, Seno, Stella organizers Venice (2016) (invited).

97 29th Marian Smoluchowski Symposium on Statistical Physics: Nonequilibrium and Theory of Fluctuations (September 12-16, 2016, Zakopane, Poland) (did not attend) (invited).

98 Nonequilibrium processes at the nanoscale, Kavli Institute for Theoretical Physics China (2016).

99. Quantifying complex transport with Lévy walks: from cold atoms to humans and robots. WE-Heraeus Seminar (organizer).

100 Ergodicity breaking and anomalous dynamics, Warwick EPSRC mathematics symposium in partnership with the London Mathematical Laboratory. Colm Connaughton, Nick Moloney, Yuzuru Sato and Nick Watkins organisers (Warwick) (10-12 August 2016) (invited).

101 The 19th Israel mini workshop on applied and computational mathematics Bar Ilan university, Jeremy Schiff organiser (Dec. 2016) (invited).

102 KIAS workshop on stochasticity and fluctuations in small systems. Jae-Hyung Jeon organizer, Postech Pohang-Korea (2016) (invited).

103 XXIX Smoluchowski Symposia Krakow (2017) (invited)

104 TAU-PU spring school and workshop on Stochastic Processes in Soft and Biological Systems. Tel Aviv April (2017) (invited)

105 Theory and Modeling of Complex System in Life Sciences, D. Grebenkov, S. Nechaev, S. Smirnov Saint-Petesburg, 18-22 Sept. (2017) (invited).

106 Large Deviations in statistical Phsycis ICTS centre Bangalore Abhishek Dhar, Hugo Touchette (organsiers). 14-24 Aug. (2017) (invited).

107 Fractional Calculus Probability and Non Linear Operator Enrico Scalas, Gianni Pagnini and Jozsef Lorinczi organisers, Bilbao $8-10$ Nov.(2017) (invited, did not attend).

108 Correlations, Fluctuations and anomalous transport in systems far from equilibrium, Yariv Kafri, Satya Majumdar and David Mukamel organisers, Weizmann Jan. (2018) (invited).

109 Symposium in honor of Igor Sokolov's 60th birthday Campus Nord of Humboldt University Feb. 26 (2018) Benjamin Lindner, Ralf Metzler, Misha Zaks organisers (invited).

110 Unsolved Problem in Noise, Janusz Smulko Chair, Lucasz Machura (organisers) Gdansk (9-13 July (2018) invited.

111. Workshop Ergodicity Breaking in Many Body Systems Altshuler, Beims, Casati, Dickman, Flach, Politi organizers Natal Brazil Nov 12-23 (2018) (invited).

112. Probabilistic methods in statistical physics for extreme statistics and rare events, G. Schehr and D. Holcman Centro di Ricerca Matematica (CRM) Ennio de Giorgi, Pisa Italy (2018) invited. 17-21 Sept.

113. Venice meeting on Sluctuations in Small Complex Systems IV $14-18$ October (2018) Venezia (invited).

114. 2nd Italy-Israel meeting in non-equilibrium physics September $5-7, 2018$ at Salerno University, Italy.

115. New Trends in the Nonequilibrium Statistical Mechanics: Classical and Quantum Systems, Erice, at the Ettore Majorana Center, $25-31$ July 2018 (invited).

116. Time and fundamentals of quantum mechanics Weizmann E. Pollack organizer, 2019 (invited)

117. Random Walks and Intracellular Transport, Manchester UK Sergei Fedotov and Nickolay Korabel organizers (2019) (invited).

118. the XXXIInd Marian Smoluchowski Symposium on Statistical Physics entitled Information processing, Krakow, Poland, (2019) (invited)

119. Anomalous diffusion: wild and bad? Second Bad Wildbad meeting on random processes and applications $23-25$ Sept. (2019).

120 Quantization of dissipative chaos: Ideas and means WE-Heraeus-Seminar Flach, Kurths, Ivanchenko (organisers) 2019 (invited).

121 Sectional Meeting of the American Mathematical Society at Tufts University Claude Greengard Christoph Brgers (organisers) March 21-22, 2020 (invited). Cancelled due to coronavirus.

122 German Physical Society (DPG) Spring Meeting March 15th - 20th Dresden, Markus Br (chair) Walter Zimmermann (vice chair) (2020) (invited) Video conference..

123 Israel Physical Society Meeting, Soft matter and biological physics, Memi Beer organizer, Weizmann, Feb. 17 (2020) (invited).

124 Fluctuations in small complex systems V, Metzler, Oshanin, Seno, Stella organizers Venice (2020) covid-19 postponed (invited).

125 Classical and Quantum Transport Processes: Current State and Future Directions Mejia-Monasterio, Imparato, Kundu, Rondoni organizers ICTS Bangalore, 21st of Sept.– 2nd of Oct (2020) cov-19 postponed (invited).

126 International conference on Statistical Physics Chania-Crete G. Kaniadakis and F. Oliviera 13-17 July (2020) postponed to 2021 (invited).

126. Fractional Differential Equations, Isac Newton Institute for Mathematical Sciences Kolokoltsov Lrinczi, Nualar, Roeckner and Sacerdote organisers. Cambridge UK (2021) covid-19 posponed (invited)

127. 33rd Marian Smoluchowski Symposium on Statistical Physics: on-line conference beamed from Crackow (2020).

Abstracts Contributed to Conferences, Poster Sessions

1. *Brownian Type of Motion of a Randomly Kicked Particle Far and Close to the Diffusion Limit*, Israel Physical Society Annual Meeting, Bar Ilan University, (1995).

2. *Bi-Directional Shot Noise in a Singly Occupied Channel*, Austrian - Israeli - German Symposium on Dynamical Processes in Condensed Molecular Systems. Baden, Austria, (1995).

3. *Chaotic Biased Motion*, the V-th Bar-Ilan Conference on Frontiers in Condensed Matter Physics, Israel (1997).

4. *Crossover From Dispersive to Regular Transport in Biased Maps*, Workshop on Chaos, Kinetics and Non-linear Dynamics in Fluids and Plasmas, Carry Le Rouet, France, (1997).

5. *One Dimensional Stochastic Lévy Lorentz Gas*, NATO Advanced Study Institute: "Dynamics: Models and Kinetic Methods for Non-equilibrium Many-Body SystemLeiden, the Netherlands (1998).

6. *Distribution of Single Molecules Line Widths*, American Conference on Theoretical Chemistry, Boulder Colorado (1999).

7. *Anomalous Diffusion and Relaxation Close to Thermal Equilibrium: A Fractional Fokker-Planck Equation Approach*, American Conference on Theoretical Chemistry, Boulder Colorado (1999).

8. *Distribution of Single Molecules Line Widths in Disordered Solids*, Hole Burning and Related Spectroscopies, HBRS 99, Hourtin France (1999).

9. *A Stochastic Theory of Single Molecule Spectroscopy*, StatPhys21, Cancun, Mexico (2001).

10. *Fluctuations in Single Molecule Spectroscopy*, Gordon Research Conference, Theoretical Physical Chemistry Summer School, Roger–Williams University Rhode Island (2002).

11. *Aging in Dispersive Transport* ACS meeting NYC (2003).

12. *Levy Statistics for Random Single–Molecule Line Shapes in a Glass* Statphys 22 Bangalore India (2004).

13. *Single–Molecule Spectroscopy in Low Temperature Glasses* Complexity, Metastability, and Non-Extensivity Erice Sicily (2004).

Invited visits to institutions

1. Prof. Wild, and Dr. Zumofen Physical Chemistry department ETH Zurich (1999,2000).

2. Prof. Orrit, CNRS university of Bordeaux (2000)

4. Prof. Metzler, Niels Bohr Institute, Copenhagen, Physics Department (2005,2006).

5. Prof. Kuno Notre Dame University Chemistry Department (2005).

6. Dr. P. Degiovanni, Ecole Normale Superiore Lyon (2006).

7. Prof. Sokolov, Humboldt University of Berlin (2007,2012).

8. Prof. Freidrich Munster University (2007).

9. Prof. Ralf Metzler Munich (2007,2011).

10. Dr. Golan Bel Los-Alamos (2008,2009).

11. Prof. Peter Hänggi University of Augsburg (2010,2011,2012,2013,2014,17,18, 19).

12. Development of the Teaching and Research Capacity of Young Academic Staff at Wrocklaw University of Technology. A mini course on normal and anomalous stochastic processes. Host Prof. Karina Weron (2010).

13. Tampere University of Technology Finland Prof. Ralf Metzler (2011).

14. Potsdam University, Prof. Ralf Metzler (2012,2013).

15. Max Planck Institute for complex systems, Dresden, Prof. Holger Kantz (2012,13,14,16,17,18).

16. Frie Universität Berlin Dr. Eric Lutz (2012,2013).

17. Laboratoire de Physique Theorique de la matiere condensee (LPTMC), Paris, Prof. Olivier Benichou (2013,2016).

18. Erlangen University, Prof. Eric Lutz (2014,2015)

19. Center for theoretical Physics of Complex Systems Daejeon Korea Prof. Sergey Flach (2015).

20. International Center for Theoretical Sciences Tata Institute of Fundamantal Research Bangalore India Prof. Abhishek Dhar (2016,17).

21. Department of Physics, Keio University Yokohama Japan Prof. Keiji Saito (2016).

22. Prof. Sergey Denisov, Augsburg University (2017, 18).

23. Prof. Guenter Radons Technical University Chemnitz (2019).

24. Prof. Aljaz Godec Max Planck Institute Goettingen (2019).

25. Prof. Eric Lutz, Univerisy of Stuttgart (2019).

Additional Employment

1. Scientific programming for the Free Electron Laser Project - Engineering School, Tel-Aviv university (1995).

Seminar and Colloquium

MIT - Physical Chemistry, MIT- Applied Math, Tel Aviv- Physics, Tel Aviv - Chemistry, Weizmann- Physical Chemistry, Hebrew- Physical Chemistry, CNRS Bordeaux, ETH Zurich- Physical Chemistry, Technion - Physical Chemistry, Bar Ilan - Physics, Ben Gurion University- Physical Chemistry, Washington University - Chemistry, Notre Dame- Chemistry, The University of Chicago - James Franck Institute, University of Arkansas- Physics, MIT-Physics Chez Pierre Seminar, Notre Dame- Phys. Chem. Seminar, Argonne-Notre Dame Collaborative Work Shop, Nordita–Niels Bohr institute Physics (Copenhagen), Ecole Normale Superiure Physics (Paris), Technion Physics, HIT Holon, Beer-Sheva Nanoscience seminar, University of Augsburg Physics, Hebrew Univ. nonlinear seminar, Ecole Normale Superiure Physics (Lyon), Boston University, Santa Barbara, University of Munster, Humboldt University of Berlin, Courant Institute of Mathematical Sciences, Columbia University, Munich Technical University, Los Alamos National lab, Seoul National University, Univ. of New Mexico Albuquerque, Boston University-Harvard-MIT theoretical Phys. Chem. student seminar, Institut de Physique Theorique in Saclay, the Laboratoire de Physique Theorique et Modeles Statistiques and Laboratoire de Physique Theorique both in Orsay, Bar Ilan Applied math, Tampere University of Technology, Weizmann stat-phys seminar, Freie Universitat Berlin, Fritz-Haber-Farkash Hebrew Univ, Sede-Boqer Ben-Gurion University. Physics Potsdam University, Physics colloquium Erlangen, Nagoya University Physics Seminar, Tokyo Institute of Technology-Physics, Center for theoretical Physics of Complex Systems Daejeon Korea, Tata Institute of Fundamantal Research Bangalore, Raman Resaerch Institute Bangalore, Keio university Yokohama, Chung-Ang university Seoul, Chemnitz Technical University, Max Planck Institute Goettingen, Univeristy of Stuttgart.

Research Achievements

Prof. Barkai received his B.Sc, M.Sc, and Ph.D in Physics from Tel-Aviv university. During his Ph.D studies he helped develop the now well known fractional kinetic framework describing anomalous transport in dynamical systems. In 1998, he joined the Chemistry department in Massachusetts Institute of Technology for his postdoctoral research. He there promoted the theory of single molecule spectroscopy. He joined the faculty in Notre Dame University Indiana in 2002. In 2004 he returned to Israel to join the Physics Department at Bar-Ilan University. He now works on the theory of weak ergodicity breaking, and infinite ergodic theory, developing an extension of standard ergodic statistical mechanics. He continued developing theories of photon counting statistics for single molecule spectroscopy, in particular single photon spectroscopy. He then turned to the investigation of dynamics of single molecules in the live cell, of statistical mechanics of cold atoms in optical traps and recently the first detection problem in quantum mechanics. His work on the theory of blinking quantum dots and single molecule spectroscopy, sheds light on the fundamental problem of noise in nano technology, and his work on the first quantum detection problem is related to applications of quantum computation. In 2006 he won the Krill prize for excellence in scientific research selected by the Wolf Foundation in 2009 the Bruno memorial award, in 2011 the Friedrich Wilhelm Bessel research award and in 2017 the academic cooperation award Alexander von Humboldt foundation. In his research he combined tools from quantum optics, statistical mechanics, chemical physics and condensed matter theory.