CURRICULUM VITAE

Frederick Michael Cooper

Position:

Guest Scientist T-4
Physics of Condensed Matter and Complex Systems, Los Alamos National Labs
Los Alamos, NM 87545
External Professor, Santa Fe Institute
1399 Hyde Park Road
Santa Fe, NM 87501
e-mail: cooper@santafe.edu

Home Address:

1117 South Plata Circle
Santa Fe, NM 87501
Phone: (505) 982-4763

Fred Cooper received his B. S. in Physics *summa cum laude* from City College of New York in 1964 and his Ph.D. in Theoretical Physics from Harvard in 1968 under the direction of Nobel Laureate Sheldon Lee Glashow. He has held the following positions: Lecturer, 1964, the City College of New York; Instructor, 1968-70, Cornell University; Assistant Professor, 1970-75, at the Belfer Graduate School of Science, Yeshiva University, New York; Member, 1977, The Institute for Advanced Study, Princeton; Visiting Professor, 1985-86, Boston University; Visiting Professor, 1988-89, Brown University;Visiting Professor, University of New Hampshire 1993. Research Professor, University of New Hampshire 1994-1995. Member Santa Fe Institute (1991-1995)Visiting Professor 1998-2000 Boston College. He has been a Staff Member in T-8 from1975-2005, has been Deputy Group Leader from 1982-1994 Group Leader from 1995-2000. Guest Scientist at the Santa Fe Institute (2003-2011). Program Director for Theoretical Physics at the National Science Foundation (9/02-9/05 and 9/06-10-09, Staff Member T-4, LANL 2010- 2012, Visiting Scholar, Dept. of Earth and Planetary Sciences, Harvard University (2013-2014). External Professor Santa Fe Institute (2011-present) Guest Scientist Center for Nonlinear Studies, LANL 2014-present).

Areas of Technical Proficiency: Quantum Field Theory, Nonequilibrium Phase Transitions, Nonlinear Systems and Soliton dynamics, Noisy Reaction-Diffusion systems, Quantum Chaos, Pattern Formation in Chemical Reactions.

Research Publications during the last three years with SFI affiliation

1. Avinash Khare, Fred Cooper, Avadh Saxena, "Approximate Analytic Solutions to Coupled Nonlinear Dirac Equations" Physics Letters A, Volume 381, Issue 12, 26 March 2017, Pages 1081-1086.

2. Franz Mertens, Fred Cooper, Edward Arevalo,Avinash Khare, Avadh Saxena, and Alan Bishop, "Variational Approach to studying solitary waves in the NLSE with Complex Potentials" Physical Review E 94 (3), 032213.

3. Franz Mertens, Fred Cooper, Niurka Quintero Sihong Shao, Avinash Khare and Avadh Saxena "Solitary waves in the nonlinear Dirac equation in the presence of external driving forces". J. Phys A. Math Theor 49 (2016) 065402.

4. Franz G. Mertens, Fred Cooper, Sihong Shao, Niurka R. Quintero, Avadh Saxena, A. R. Bishop "Nonlinear Dirac equation solitary waves under a spinor force with different components" Journal of Physics A: Mathematical and Theoretical 50 (14), 145201 '

5. Fred Cooper, "Bridging the two worlds: Confessions of a Buddhist Theoretical Physicist" Sufi Journal (Summer 2017).

6. Niurka Quintero, Franz Martens, Fred Cooper, Avadh Saxena, Alan Bishop "Speed-of-light pulses in the massless nonlinear Dirac equation with a potential" . Physical Review E 96 (5), 052219

7. Fred Cooper,John F. Dawson,Franz G. Mertens, Edward Arevalo, Niurka R. Quintero, Bogdan Mihaila, Avinash Khare and Avadh Saxena. "Response of exact solutions of the nonlinear Schrödingerequation to small perturbations in a class of complex external potentials having supersymmetry and parity-time symmetry" Journal of Physics A: Mathematical and Theoretical 50 (48), 485205. (2017)

8. "Universal scaling and ferroelectric hysteresis regimes in the giant squid axon propagating action potential: a Phase Space Approach" NK Jurisic, F Cooper - preprint arXiv:1711.03575, 2017.

9. "Stability of new exact solutions of the nonlinear Schrödingerequation in a Poschl-Teller external potential" JF Dawson, F Cooper, A Khare, B Mihaila, E Arevalo, R Lan, A Comech, Avadh Saxena J. Phys. A: Math. Theor. 50 505202 (2017)

10. "Exact solutions of a generalized variant of the derivative nonlinear Schrödingerequation in a Scarff II external potential and their stability properties" A. Khare, F. Cooper, JF Dawson, J. Phys. A: Math. Theor. 51 445203 (2018)

11. Niurka R. Quintero, Bernardo Sanchez-Rey, Fred Cooper, and Franz G. Mertens,"Length-scale competition in the parametrically driven nonlinear Dirac equation with a spatially periodic force" , J. Phys. A: Math. Theor. 52 (2019) 285201

12. "Composite Molecules and Decoupling in Reaction Diffusion Models" JF Dawson, F Cooper, B Mihaila, preprint arXiv:1910.06429

13. Fred Cooper, Avinash Khare, Niurka R Quintero , Bernardo Sanchez-Rey, Franz G Mertens and Avadh Saxena "Parametrically driven nonlinear Dirac equation with arbitrary nonlinearity" J. Phys. A: Math. Theor. 53 (2020) 075203 (17pp).

14. Fred Cooper and Chara Nelson–"DREAM YOGA A Conversation with Tenzin Wangyal Rinpoche" , Sufi Journal, Summer 2019.

15. Fred Cooper "Recollecting Mitchell Feigenbaum-a Chaos Pioneer" Santa Fe Institute July 5, 2019

16. "Stability and response of trapped Solitary Wave solutions of coupled nonlinear Schrödinger equations in a complex external potential obtainable from Supersymmetry having anti-PT symmetry" Fred Cooper,Efstathios G. Charalampidis, Avinash Khare, John Dawson, Avadh Saxena (to be submitted)

Citation information (from Google Scholar)
Citation indices

	All	Since 2015+
Citations	12720	2383
h-index	48	19
i10	133	42

Recent Talks

1. F. Cooper "The Use of Time Dependent Variational Methods to study the dynamics of solitary waves" Aspen Center for Physics. Conference to celebrate Mike Simmons 80th birthday, July 29, 2017.

2. F. Cooper "The Use of Time Dependent Variational Methods to study the dynamics of solitary waves" University of Delhi -April 2018.

3. F. Cooper "The Use of Collective coordinates to study the dynamics and stability of solitary waves" University of Texas, Arlington -April 25 2019.