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Curriculum Vitae

Personal Data

Birthday/-place: 12 September 1963, Rehau/Ofr., Bavaria, Germany
Nationality: Germany, United States of America
Family: married, two daughters

Education

June 1999: *Dr. rer. nat. habil.*, TU München (Germany)
July 1992: *Dr. rer. nat.* (Ph.D.), *mit Auszeichnung* (with distinction),
TU München; Dissertation “*Koexistenzanomalien in der
Dynamik isotroper Systeme*” (“Coexistence anomalies in
the dynamics of isotropic Systems”)
May 1988: Diploma (M.S. degree) in physics, *Dipl.-Phys. (Univ.)*,
mit Auszeichnung (with distinction), TU München;
Diploma thesis “*Elastische Phasenübergänge zweiter
Ordnung in inhomogenen Medien*” (“Second-order elastic
phase transitions in inhomogeneous media”)
1982 – 1988: Physics studies (*Allgemeine Physik*) at the TU München
May 1982: *Abitur* (premium grade average 1.0: 897 pts. out of 900)
1973 – 1982: *Gymnasium* (high school) Bad Kissingen (Germany)
1969 – 1973: Elementary school at Göttingen and Bad Kissingen

Academic Career

- since 2021: Lead Editor, *Physical Review E*
since 2020: Professor, Faculty of Health Sciences, Virginia Tech
2016 – 2022: Director, Center for Soft Matter and Biological Physics
since 2006: Professor, Physics Department, Virginia Tech
2003 – 2006: Associate Professor, Physics Department, Virginia Tech
1998 – 2003: Assistant Professor, Physics Department, Virginia Tech
1997 – 1998: Senior Scientist, Institute for Theoretical Physics, TU München,
Deutsche Forschungsgemeinschaft Habilitation Fellowship
1995 – 1997: Postdoctoral Research Associate at Oxford University,
Theoretical Physics (Prof. John L. Cardy)
1993 – 1995: Postdoctoral Research Fellow at Harvard University,
Condensed Matter Theory (Prof. David R. Nelson)
1988 – 1993: Research Assistant, Institute for Theoretical Physics, TU München
1987 – 1988: Diploma Student, TU München (Prof. Franz Schwabl)
1984 – 1987: Research Student, Profs. G. Kalvius, F. Schwabl, TU München

Honors, Visiting Appointments, and Fellowships

- summer 2022: Member, APS Leo P. Kadanoff Prize Selection Committee
Nov. 2019: Visiting Researcher, SISSA Trieste
Sep. 2019: Visiting Researcher, Higgs Centre, University of Edinburgh
May–July 19: Visiting Researcher, Universidade de Lisboa
2019 – 2020: Editorial Boards *Journal of Physics A: Math. Theor.*; *Symmetry*
summer 2018: Member, APS Lars Onsager Prize Selection Committee
2017 – 2020: Editorial Board *Physical Review E*
2006 / 2014: VT Scholar of the Week July 24–30, 2006 and June 16–20, 2014
Nov. 2013: Elected *Fellow of the American Physical Society* (APS)
July–Dec. 12: Visiting Researcher, Institut Systèmes Complexes, Paris
Jan. 2008: American Physical Society *Outstanding Referee*
2007 – 2019: Advisory Panel of *Journal of Physics A: Math. Theor.*
Oct.–Dec. 05: Senior Visiting Member, Linacre College, Oxford
Jun.–Sep. 05: CNRS *Directeur de recherche associé*, Université Paris-Sud Orsay
1997 – 1998: *Deutsche Forschungsgemeinschaft* (DFG) *Habilitation* Fellowship
1996 – 1997: Junior Research Fellow, Linacre College, Oxford
1996 – 1997: European Community TMR Marie Curie Fellowship
1993 – 1995: *Deutsche Forschungsgemeinschaft* (DFG) Postdoctoral Fellowship
1983 – 1988: *Studienstiftung des deutschen Volkes* scholarship
1982 – 1988: *Bayerisches Begabtenstipendium* (State of Bavaria scholarship)

Research and Publications

General Research Interests: Phase Transitions and Scaling in Equilibrium and Non-Equilibrium Condensed Matter Systems

- Dynamical critical behavior near equilibrium phase transitions: dynamical universality classes; coexistence anomalies in isotropic systems; crossover and multi-critical behavior; stability against non-equilibrium perturbations; control of critical dynamics (Langevin equations; field theory; renormalization group; Monte Carlo simulations).
- Phase transitions and scaling in systems far from equilibrium: directed percolation; Burgers–Kardar–Parisi–Zhang equation; branching and annihilating random walks; diffusion-limited reactions; anomalous diffusion; driven diffusive systems; driven Bose–Einstein condensation; complex Ginzburg–Landau equation; control of cooperative non-equilibrium systems (stochastic master and Langevin equations; field theory; renormalization group; Monte Carlo simulations).
- Statistical mechanics of flux lines in superconductors: mapping to boson quantum mechanics; influence of correlated disorder; phase diagrams; properties of the Bose glass phase; vortex transport and flux pinning; voltage and flux density noise; non-equilibrium relaxation and aging (path-integral description; extensive Monte Carlo and Langevin molecular dynamics simulations).
- Dynamics and aging scaling in disordered systems: defect influence on structural phase transitions, central peak; Coulomb gap in disordered semiconductors, non-equilibrium relaxation and aging in the Coulomb glass; dynamics of vortices in disordered superconductors and of skyrmion topological defects in magnetic films (Landau–Ginzburg theory; Monte Carlo and Langevin dynamics simulations).
- Applications of statistical physics to biological systems: glassy properties of prokaryotic bacteria; (re-)binding reactions on cell membranes, effects of receptor clustering; population dynamics: predator-prey interactions, cyclic competition; stability and control of noise-induced patterns; evolutionary dynamics; ecosystem diversity and stability; spreading and control of epidemics; neural networks (master equation; field theory; Monte Carlo simulations).

Advanced Graduate Textbook

- [1] “Critical Dynamics – A field theory approach to equilibrium and non-equilibrium scaling behavior”, 498 pp., Cambridge University Press, March 2014; ISBN9780521842235, www.cambridge.org/9780521842235; as of 30 December 2022: **514** citations.

Peer-Reviewed Original Research Publications

As of 30 December 2022: **4755** citations listed in Google Scholar; h-index 36; i10-index 75.

- [2] *W. Gasser and U.C.T.*, “Collective excitations of a layered electron gas in a strong magnetic field”, *Z. Phys. B – Condensed Matter* **69**, 87 – 96 (1987).
- [3] *F. Schwabl and U.C.T.*, “Elastic phase transitions in inhomogeneous media”, *Phase Transitions* **34**, 69 – 103 (1991).
- [4] *F. Schwabl and U.C.T.*, “Defect-induced condensation and central peak at structural transitions”, *Phys. Rev. B* **43**, 11112 – 11135 (1991).
- [5] *U.C.T. and F. Schwabl*, “Critical dynamics of the $O(n)$ -symmetric relaxational models below the transition temperature”, *Phys. Rev. B* **46**, 3337 – 3361 (1992); **40** citations.
- [6] *U.C.T. and F. Schwabl*, “Influence of cubic and dipolar anisotropies on the static and dynamic coexistence anomalies of the time-dependent Ginzburg-Landau models”, *Phys. Rev. B* **48**, 186 – 209 (1993) [cond-mat/9303044].
- [7] *E. Frey, U.C.T., and F. Schwabl*, “Crossover from self-similar to self-affine structures in percolation”, *Europhys. Lett.* **26**, 413 – 418 (1994) [cond-mat/9403093].
- [8] *E. Frey, U.C.T., and F. Schwabl*, “Crossover from isotropic to directed percolation”, *Phys. Rev. E* **49**, 5058 – 5072 (1994) [cond-mat/9404004]; **42** citations.
- [9] *E. Frey and U.C.T.*, “Two-loop renormalization group analysis of the Burgers–Kardar–Parisi–Zhang equation”, *Phys. Rev. E* **50**, 1024 – 1045 (1994) [cond-mat/9406068]; **206** citations.
- [10] *U.C.T., H. Dai, D.R. Nelson, and C.M. Lieber*, “Coulomb gap and correlated vortex pinning in superconductors”, *Phys. Rev. Lett.* **74**, 5132 – 5135 (1995) [cond-mat/9412021]; **53** citations.
- [11] *U.C.T. and E. Frey*, “Reply to Comment on ‘Two-loop renormalization group analysis of the Burgers–Kardar–Parisi–Zhang equation’ ”, *Phys. Rev. E* **51**, 6319 – 6322 (1995).
- [12] *U.C.T. and D.R. Nelson*, “Interactions and pinning energies in the Bose glass phase of vortices in superconductors”, *Phys. Rev. B* **52**, 16106 – 16124 (1995) [cond-mat/9505024]; **67** citations.

- [13] *E. Frey, U.C.T., and T. Hwa*, “Mode-coupling and renormalization group results for the noisy Burgers equation”, *Phys. Rev. E* **53**, 4424 – 4438 (1996) [cond-mat/9601049]; **103** citations.
- [14] *M. Bulenda, F. Schwabl, and U.C.T.*, “Defect-induced condensation and central peak at elastic phase transitions”, *Phys. Rev. B* **54**, 6210 – 6221 (1996) [cond-mat/9606040].
- [15] *U.C.T. and D.R. Nelson*, “Superfluid bosons and flux liquids: disorder, thermal fluctuations, and finite-size effects”, *Phys. Rep.* **289**, 157 – 233 (1997); Err.: *Phys. Rep.* **296**, 337 – 338 (1998) [cond-mat/9608057]; **63** citations.
- [16] *J. Cardy and U.C.T.*, “Theory of branching and annihilating random walks”, *Phys. Rev. Lett.* **77**, 4780 – 4783 (1996) [cond-mat/9609151]; **335** citations.
- [17] *U.C.T. and Z. Rácz*, “Critical behavior of $O(n)$ -symmetric systems with reversible mode-coupling terms: Stability against detailed-balance violation”, *Phys. Rev. E* **55**, 4120 – 4136 (1997); Err.: *Phys. Rev. E* **101**, 059901(E) – 1-2 (2020) [cond-mat/9610159].
- [18] *C. Wengel and U.C.T.*, “Weakly pinned Bose glass vs Mott insulator phase in superconductors”, *Phys. Rev. Lett.* **78**, 4845 – 4848 (1997) [cond-mat/9612093]; **49** citations.
- [19] *M.J. Howard and U.C.T.*, “‘Real’ versus ‘imaginary’ noise in diffusion-limited reactions”, *J. Phys. A: Math. Gen.* **30**, 7721 – 7731 (1997) [cond-mat/9701069]; **164** citations.
- [20] *J.L. Cardy and U.C.T.*, “Field theory of branching and annihilating random walks”, *J. Stat. Phys.* **90**, 1 – 56 (1998) [cond-mat/9704160]; **261** citations.
- [21] *U.C.T., M.J. Howard, and H. Hinrichsen*, “Multicritical behavior in coupled directed percolation processes”, *Phys. Rev. Lett.* **80**, 2165 – 2168 (1998) [cond-mat/9709057]; **60** citations.
- [22] *C. Wengel and U.C.T.*, “Properties of the Bose glass phase in irradiated superconductors near the matching field”, *Phys. Rev. B* **58**, 6565 – 6579 (1998) [cond-mat/9801264]; **36** citations.
- [23] *U.C.T., M.J. Howard, and H. Hinrichsen*, “Reply to Comment on ‘Multicritical behavior in coupled directed percolation processes’ ”, *Phys. Rev. Lett.* **81**, 2179 (1998).

- [24] *E. Frey, U.C.T., and H.K. Janssen*, “Scaling regimes and critical dimensions in the Kardar-Parisi-Zhang problem”, *Europhys. Lett.* **47**, 14 – 20 (1999) [cond-mat/9807087]; **46** citations.
- [25] *U.C.T., J.E. Santos, and Z. Rácz*, “Non-equilibrium critical behavior of $O(n)$ -symmetric systems: Effect of reversible mode-coupling terms and dynamical anisotropy”, *Eur. Phys. J. B* **7**, 309 – 330 (1999); Err.: *Eur. Phys. J. B* **9**, 567 – 568 (1999) [cond-mat/9807207].
- [26] *H.K. Janssen, U.C.T., and E. Frey*, “Exact results for the Kardar-Parisi-Zhang equation with spatially correlated noise”, *Eur. Phys. J. B* **9**, 491 – 511 (1999) [cond-mat/9808325]; **50** citations.
- [27] *Y.Y. Goldschmidt, H. Hinrichsen, M.J. Howard, and U.C.T.*, “Non-equilibrium critical behavior in unidirectionally coupled stochastic processes”, *Phys. Rev. E* **59**, 6381 – 6408 (1999) [cond-mat/9809166]; **54** citations.
- [28] *B.A. Kaufmann, F. Schwabl, and U.C.T.*, “Critical dynamics at incommensurate phase transitions and NMR relaxation experiments”, *Phys. Rev. B* **59**, 11 226 – 11 243 (1999) [cond-mat/9811167].
- [29] *M. Bulenda, U.C.T., and F. Schwabl*, “Dimensional crossover in dipolar magnetic layers”, *J. Phys. A: Math. Gen.* **33**, 1 – 21 (2000) [cond-mat/9907029].
- [30] *B. Schmittmann, H.K. Janssen, U.C.T., R.K.P. Zia, K.-t. Leung, and J.L. Cardy*, “Viability of competing field theories for the driven lattice gas”, *Phys. Rev. E* **61**, 5977 – 5980 (2000) [cond-mat/9912286].
- [31] *S. Trimper, U.C.T., and G.M. Schütz*, “Reaction-controlled diffusion”, *Phys. Rev. E* **62**, 6071 – 6077 (2000) [cond-mat/0001387].
- [32] *T. Aspelmeier, J. Magnin, W. Graupner, and U.C.T.*, “Random walks with imperfect trapping in the decoupled-ring approximation”, *Eur. Phys. J. B* **28**, 441 – 450 (2002) [cond-mat/0107434].
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- [34] *U.C.T. and E. Frey*, “Universality classes in the anisotropic Kardar-Parisi-Zhang model”, *Europhys. Lett.* **59**, 655 – 661 (2002) [cond-mat/0108306].
- [35] *U.C.T., V.K. Akkineni, and J.E. Santos*, “Effects of violating detailed balance on critical dynamics”, *Phys. Rev. Lett.* **88**, 045702 – 1-4 (2002) [cond-mat/0109433]; **42** citations.

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- [37] *O. Deloubrière, H.J. Hilhorst, and U.C.T.*, “Multispecies pair annihilation reactions”, *Phys. Rev. Lett.* **89**, 250601 – 1-4 (2002) [cond-mat/0209471].
- [38] *E. Shaw, D.R. Hill, N. Brittain, D.J. Wright, U.C.T., H. Marand, R.F. Helm, and M. Potts*, “Unusual water flux in the extracellular polysaccharide of the Cyanobacterium *Nostoc Commune*”, *Appl. Environ. Microbiol.* **69**, 5679 – 5684 (2003); **65** citations.
- [39] *B.A. Reid, U.C.T., and J.C. Brunson*, “Reaction-controlled diffusion: Monte Carlo simulations”, *Phys. Rev. E* **68**, 046121 – 1-19 (2003) [cond-mat/0306014].
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- [43] *H.K. Janssen, F. van Wijland, O. Deloubrière, and U.C.T.*, “Pair contact process with diffusion: failure of master equation field theory”, *Phys. Rev. E* **70**, 056114 – 1-7 (2004) [cond-mat/0408064]; **42** citations.
- [44] *M. Gopalakrishnan, K. Forsten-Williams, T.R. Cassino, L. Padro, T.E. Ryan, and U.C.T.*, “Ligand rebinding: self-consistent mean-field theory and numerical simulations applied to surface plasmon resonance studies”, *Eur. Biophys. J.* **34**, 943 – 958 (2005) [q-bio.QM/0406004]; **38** citations.
- [45] *M. Gopalakrishnan, K. Forsten-Williams, M.A. Nugent, and U.C.T.*, “Effects of receptor clustering on ligand dissociation kinetics: Theory and simulations”, *Biophys. J.* **89**, 3685 – 3700 (2005) [q-bio.SC/0407015]; **62** citations.
- [46] *H.J. Hilhorst, M.J. Washenberger, and U.C.T.*, “Symmetry and species segregation in diffusion-limited pair annihilation”, *J. Stat. Mech.* P10002 – 1-19 (2004) [cond-mat/0409079].

- [47] *M. Mobilia, I.T. Georgiev, and U.C.T.*, “Fluctuations and correlations in lattice models for predator-prey interaction”, *Phys. Rev. E* **73** (Rapid Communications), 040903(R) – 1-4 (2006) [q-bio.PE/0508043]; **90** citations.
- [48] *M.J. Washenberger, M. Mobilia, and U.C.T.*, “Influence of local carrying capacity restrictions on stochastic predator-prey models”, *J. Phys. Condens. Matter* **19**, 065139 – 1-14 (2007) [cond-mat/0606809]; **45** citations.
- [49] *V. Lecomte, U.C.T., and F. van Wijland*, “Current distribution in systems with anomalous diffusion: renormalization group approach”, *J. Phys. A: Math. Theor.* **40**, 1447 – 1465 (2007) [cond-mat/0611265].
- [50] *T.J. Bullard, J. Das, G.L. Daquila, and U.C.T.*, “Vortex washboard voltage noise in type-II superconductors”, *Eur. Phys. J. B* **65**, 469 – 484 (2008) [cond-mat/0511509].
- [51] *U. Dobramysl and U.C.T.*, “Spatial variability enhances species fitness in stochastic predator-prey interactions”, *Phys. Rev. Lett.* **101**, 258102 – 1-4 (2008) [arXiv:0804.4127]; **43** citations.
- [52] *T. Klongcheongsan, T.J. Bullard, and U.C.T.*, “Nonequilibrium steady states of driven magnetic flux lines in disordered type-II superconductors”, *Supercond. Sci. Technol.* **23**, 025023 – 1-13 (2010) [arXiv:0911.4066].
- [53] *Q. He, M. Mobilia, and U.C.T.*, “Spatial rock-paper-scissors models with inhomogeneous reaction rates”, *Phys. Rev. E* **82**, 051909 – 1-11 (2010) [arXiv:1004.5275]; **98** citations.
- [54] *M.T. Shimer, U.C.T., and M. Pleimling*, “Nonequilibrium relaxation and scaling properties of the two-dimensional Coulomb glass in the aging regime”, *EPL (Europhys. Lett.)* **91**, 67005 – 1-6 (2010) [arXiv:1007.1929].
- [55] *Q. He, M. Mobilia, and U.C.T.*, “Coexistence in the two-dimensional May-Leonard model with random rates”, *Eur. Phys. J. B* **82**, 97 – 105 (2011) [arXiv:1101.4963]; **54** citations.
- [56] *G.L. Daquila and U.C.T.*, “Slow relaxation and aging kinetics for the driven lattice gas”, *Phys. Rev. E* **83**, 051107 – 1-11 (2011) [arXiv:1102.2824] **30** citations.
- [57] *M. Pleimling and U.C.T.*, “Relaxation and glassy dynamics in disordered type-II superconductors”, *Phys. Rev. B* **84**, 174509 – 1-10 (2011) [arXiv:1106.1130].

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- [60] *U. Dobramysl and U.C.T.*, “Environmental versus demographic variability in two-species predator-prey models”, *Phys. Rev. Lett.* **110**, 048105 – 1-5 (2013) [arXiv:1206.0973]; **39** citations.
- [61] *U.C.T.*, “Population oscillations in spatial stochastic Lotka-Volterra models: a field-theoretic perturbational analysis”, *J. Phys. A: Math. Theor.* **45**, 405002 – 1-34 (2012) [arXiv:1206.2303]; **53** citations.
- [62] *U. Dobramysl, H. Assi, M. Pleimling, and U.C.T.*, “Relaxation dynamics in type-II superconductors with point-like and correlated disorder”, *Eur. Phys. J. B* **86**, 228 – 1-15 (2013) [arXiv:1211.6929].
- [63] *U.C.T. and S. Diehl*, “Perturbative field-theoretic renormalization group approach to driven-dissipative Bose-Einstein criticality”, *Phys. Rev. X* **4**, 021010 – 1-21 (2014) [arXiv:1312.5182]; **74** citations.
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- [67] *H. Assi, H. Chaturvedi, U. Dobramysl, M. Pleimling, and U.C.T.*, “Relaxation dynamics of vortex lines in disordered type-II superconductors following magnetic field and temperature quenches”, *Phys. Rev. E* **92**, 052124 – 1-16 (2015) [arXiv:1505.06240].
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- [69] *H. Assi, H. Chaturvedi, M. Pleimling, and U.C.T.*, “Structural relaxation and aging scaling in the Coulomb and Bose glass models”, *Eur. Phys. J. B* **86**, 252 – 1-15 (2016) [arXiv:1606.02971].
- [70] *H. Chaturvedi, H. Assi, U. Dobramysl, M. Pleimling, and U.C.T.*, “Flux line relaxation kinetics following current quenches in disordered type-II superconductors”, *J. Stat. Mech.* 083301 – 1-16 (2016) [arXiv:1606.06100].
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- [76] *B.L. Brown, U.C.T., and M. Pleimling*, “Effect of the Magnus force on skyrmion relaxation dynamics”, *Phys. Rev. B* **97**, 020405(R) – 1-5 (Rapid Communications) (2018) [arXiv:1801.00774]; **35** citations.
- [77] *H. Chaturvedi, N. Galliher, U. Dobramysl, M. Pleimling, and U.C.T.*, “Dynamical regimes of vortex flow in type-II superconductors with parallel twin boundaries”, *Eur. Phys. J. B* **91**, 294 – 1-13 (2018) [arXiv:1710.03679].
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- [81] *B.L. Brown, U.C.T., and M. Pleimling*, “Skyrmion relaxation dynamics in the presence of quenched disorder”, *Phys. Rev. B* **100**, 024410 – 1-8 (2019) [arXiv:1906.12146].
- [82] *W. Liu and U.C.T.*, “Nucleation of spatiotemporal structures from defect turbulence in the two-dimensional complex Ginzburg–Landau equation”, *Phys. Rev. E* **100**, 052210 – 1-15 (2019) [arXiv:1905.07317].
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- [84] *H. Chaturvedi, U. Dobramysl, M. Pleimling, and U.C.T.*, “Critical scaling and aging near the flux-line-depinning transition”, *Phys. Rev. B* **101**, 024515 – 1-8 (2020) [arXiv:1907.05804].
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- [87] *R.I. Mukhamadiarov, S. Deng, S.R. Serrao, Priyanka, R. Nandi, L.H. Yao, and U.C.T.*, “Social distancing and epidemic resurgence in agent-based Susceptible-Infectious-Recovered models”, *Scientific Reports* **11**, 130 – 1-8 (2021) [arXiv:2006.02552].
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- [89] *R. Nandi and U.C.T.*, “Critical dynamics of anisotropic antiferromagnets in an external field”, *Phys. Rev. E* **102**, 052114 – 1-8 (2020) [arXiv:2008.11541].
- [90] *R.I. Mukhamadiarov, Priyanka, and U.C.T.*, “Parallel temperature interfaces in the Katz–Lebowitz–Spohn driven lattice gas”, *J. Stat. Mech.* 113207 – 1-20 (2020) [arXiv:2009.05650].
- [91] *R.I. Mukhamadiarov, S. Deng, S.R. Serrao, Priyanka, L.M. Childs, and U.C.T.*, “Requirements for the containment of COVID-19 disease outbreaks through periodic testing, isolation, and quarantine”, *J. Phys. A: Math. Theor.* **55**, 034001 – 1-18 (2022) [medRxiv:2020.10.21.20217331].

- [92] *Priyanka, U.C.T., and M. Pleimling*, “The role of the non-linearity in controlling the surface roughness for the one-dimensional Kardar-Parisi-Zhang growth process”, *J. Phys. A: Math. Theor.* **54**, 154002 – 1-18 (2021) [arXiv:2101.01868].
- [93] *S.R. Serrao and U.C.T.*, “Stabilizing spiral structures and population diversity in the asymmetric May–Leonard model through immigration”, *Eur. Phys. J. B* **94**, 175 – 1-15 (2021) [arXiv:2105.08126]; figures featured on journal cover of August issue 8.
- [94] *R. Nandi, U.C.T., and Priyanka*, “Dynein-inspired multilane exclusion process with open boundary conditions”, *Entropy* **2021**, 1343 – 1-13 (2021) [arXiv:2108.13608]; figures featured on journal’s main homepage.
- [95] *L.H. Yao and U.C.T.*, “Critical dynamics of the antiferromagnetic $O(3)$ nonlinear sigma model with conserved magnetization”, *Phys. Rev. E* **105**, 064128 – 1-13 (2022) [arXiv:2204.11145].
- [96] *R.I. Mukhamadiarov and U.C.T.*, “Effects of lattice dilution on the non-equilibrium phase transition in the stochastic susceptible-infectious-recovered model”, *Phys. Rev. E* **106**, 034132 – 1-8 (2022) [arXiv:2206.03906].
- [97] *M. Swailem and U.C.T.*, “Lotka–Volterra predator-prey model with periodically varying carrying capacity”, *Phys. Rev. E* **107**, 064144 – 1-16 (2023) [arXiv:2211.09276].
- [98] *L.H. Yao, M. Swailem, U. Dobramysl, and U.C.T.*, “Perturbative field-theoretical analysis of three-species cyclic predator-prey models”, *J. Phys. A: Math. Theor.* **56**, 225001 – 1-42 (2023) [arXiv:2303.08713].
- [99] *R. Tiani and U.C.T.*, “Stochastic analysis of chemical reactions in multi-component interacting systems at criticality”, *EPL (Europhys. Lett.)* **144**, 11005 – 1-7 (2023) [arXiv:2305.17726].
- [100] *M. Swailem and U.C.T.*, “Computing macroscopic reaction rates in lattice reaction-diffusion using Monte Carlo simulations”, submitted to *Phys. Rev. E* (2024) [arXiv:2404.03089].

Reviews (see also [15], [112], [113], [114], [115], [118], [119], [123], [124])

- [101] *F. Schwabl and U.C.T.*, “Continuous elastic phase transitions in pure and disordered crystals”, *Phil. Trans. R. Soc. Lond. A* **354**, 2847 – 2873 (1996) [cond-mat/9607028].
- [102] *H.K. Janssen and U.C.T.*, “The field theory approach to percolation processes”, *Ann. Phys. (NY)* **315**, 147 – 192 (2005) [cond-mat/0409670]; **194** citations.
- [103] *U.C.T., M.J. Howard, and B.P. Vollmayr-Lee*, “Applications of field-theoretic renormalization group methods to reaction-diffusion problems”, *J. Phys. A: Math. Gen.* **38**, R79 – R131 (2005) [cond-mat/0501678]; **310** citations.
- [104] *H. Assi, H. Chaturvedi, U. Dobramysl, M. Pleimling, and U.C.T.*, “Disordered vortex matter out of equilibrium: A Langevin molecular dynamics study”, *Molecular Simulation* **24**, 1401 – 1409 (2016) [arXiv:1509.02227].
- [105] *U.C.T.*, “Phase transitions and scaling in systems far from equilibrium”, *Annu. Rev. Condens. Matter Phys.* **8**, 14 – 1-26 (2017) [arXiv:1604.04487]; **36** citations.
- [106] *U. Dobramysl, M. Mobilia, M. Pleimling, and U.C.T.*, “Stochastic population dynamics in spatially extended predator-prey systems”, *J. Phys. A: Math. Theor.* **51**, 063001 – 1-47 (2018) [arXiv:1708.07055]; **102** citations; featured in *J. Phys. A Highlights of 2018* collection; figures featured on journal cover of February issue 6.
- [107] *U. Dobramysl, R. Mukhamadiarov, M. Swailem, and U.C.T.*, “Stochastic agent-based Monte Carlo simulations for reaction-diffusion models, population dynamics, and epidemic spreading”, to be submitted to *American Journal of Physics* (2024).

Contributions to Conference and Summer School Proceedings

- [108] *W. Gasser and U.C.T.*, “Spin waves of a layered ferromagnetic electron gas and of a paramagnetic electron gas in a strong magnetic field”, Proceedings, ICM 88, International Conference on Magnetism, D. Givord (Ed.), Part II, *J. Phys. (Paris)* **49**, C 8 — 1611 – 1612 (1988).
- [109] *F. Schwabl and U.C.T.*, “Local condensation at elastic phase transitions”, Proceedings, Phonons 89, 3rd International Conference on Phonon Physics and the 6th International Conference on Phonon Scattering in Condensed Matter, S. Hunklinger, W. Ludwig, and G. Weiss (Eds.), Vol. **2** (World Scientific), 1138 – 1140 (1990).
- [110] *U.C.T.*, “Localized flux lines and the Bose glass”, Proceedings, XIV Sitges Conference “Complex Behaviour of Glassy Systems”, M. Rubí and C. Pérez-Vicente (Eds.), (Springer), 298 – 307 (1997) [cond-mat/9607109].
- [111] *J. Das, T.J. Bullard, and U.C.T.*, “Vortex transport and voltage noise in disordered superconductors”, Proceedings, Statphys-Kolkata IV, International Conference on Statistical Physics, *Physica A* **318**, 48 – 54 (2003) [cond-mat/0205023].
- [112] *U.C.T.*, “Dynamic phase transitions in diffusion-limited reactions”, Proceedings, RG02, 5th International Conference on the Renormalization Group, M. Hnatič, V.B. Priezhev, and D.V. Shirkov (Eds.), *Acta Physica Slovaca* **52**, 505 – 513 (2002) [cond-mat/0205327].
- [113] *U.C.T.*, “Scale invariance and dynamic phase transitions in diffusion-limited reactions”, Proceedings, German Physical Society/DPG Spring Meeting, “Advances in Solid State Physics”, B. Kramer (Ed.), Vol. **43** (Springer-Verlag Berlin), 659 – 675 (2003) [cond-mat/0304065] **31** citations.
- [114] *U.C.T.*, “Field theory approaches to nonequilibrium dynamics”, Proceedings, Summer School “Ageing and the Glass Transition”, M. Henkel, M. Pleimling, and R. Sanctuary (Eds.), *Lecture Notes in Physics* **716** (Springer-Verlag Berlin, 2007), Chap. 7, 295 – 348 [cond-mat/0511743]; **60** citations.
- [115] *M. Mobilia, I.T. Georgiev, and U.C.T.*, “Phase transitions and spatio-temporal fluctuations in stochastic lattice Lotka-Volterra models”, Proceedings, Workshop on Applications of Methods of Stochastic Systems and Statistical Physics in Biology, *J. Stat. Phys.* **128**, 447 – 483 (2007) [q-bio.PE/0512039]; **145** citations.

- [116] *M. Mobilia, I.T. Georgiev, and U.C.T.*, “Spatial stochastic predator-prey models”, Banach Center Publ. **80**, ed. J. Miekisz, Institute of Mathematics, Polish Academy of Sciences, Warsaw, 253 – 257 (2008) [q-bio.PE/0609039].
- [117] *U.C.T.*, “Stochastic population oscillations in spatial predator-prey models”, Proceedings, CMDS-12, 12th International Symposium on Continuum Models and Discrete Systems, J. Phys.: Conf. Ser. **319**, 012019 – 1-14 (2011) [arXiv:1105.4242].
- [118] *U.C.T.*, “Renormalization group: Applications in statistical physics”, Proceedings, 49th International University Weeks for Theoretical Physics “Physics at All Scales: The Renormalization Group”, Nucl. Phys. B Proc. Suppl. **228C**, 7 – 34 (2012) [arXiv:1112.1375]; **34** citations.
- [119] *U. Dobramysl and U.C.T.*, “Environmental versus demographic variability in stochastic predator-prey models”, Proceedings, STATPHYS 25, 25th IUPAP International Conference on Statistical Physics, J. Stat. Mech. P10001 – 1-26 (2013) [arXiv:1307.4327].
- [120] *S. Chen and U.C.T.*, “Non-equilibrium relaxation in a stochastic lattice Lotka–Volterra model”, Proceedings, 9th q-bio Conference, Phys. Biol. **13**, 025005 – 1-11 (2016) [arXiv:1511.05114]; **33** citations.

Book Chapters

- [121] *F. Schwabl and U.C.T.*, “Phase transitions: renormalization and scaling”, in: “Encyclopedia of Applied Physics”, G.L. Trigg (Ed.), Vol. **13** (VCH Publishers), 343 – 371 (1995).
- [122] *T.J. Bullard, J. Das, and U.C.T.* “Dynamics of magnetic flux lines in the presence of correlated disorder”, in: “Trends in Superconductivity Research”, P.S. Lewis (Ed.) (Nova Science Publishers), 63 – 72 (2004) [cond-mat/0305061].
- [123] *U.C.T.*, “Field-theoretic methods”, in: “Encyclopedia of Complexity and System Science”, R.A. Meyers (Ed.), 3360 – 3374 (Springer-Verlag New York, 2009) [arXiv:0707.0794].
- [124] *U.C.T.*, “Fluctuations and correlations in chemical reaction kinetics and population dynamics”, in “Chemical kinetics beyond the textbook”, K. Lindenberg, R. Metzler, and G. Oshanin (Eds.), Chap. 1, 1 – 34, (World Scientific Publ., Singapore, 2019) [arXiv:1807.01248].

- [125] *U.C.T.*, “Stochastic spatial Lotka–Volterra predator-prey models”, to appear in “Order, disorder, and criticality. Advanced problems of phase transition theory and complex systems”, Vol. VIII, Y. Holovatch (ed.), (World Scientific Publ., Singapore, 2024) [arxiv:2405.05006].

Miscellaneous

- *U.C.T.*, Book review of *W.D. McComb*, “Renormalization Methods: A Guide for Beginners”, *Physics Today* June 2005, 62 – 63 (2005).
- *D. Bäuerle, B. Drossel, R. Folk, E. Frey, and U.C.T.*, “Nachruf (obituary) Franz Schwabl”, *Physik Journal* **9**, 1 – 53 (2010); English version: “Death Notice” no. 489 (2010) in *Physics Today* online [http://www.physicstoday.org/obits/notice_489.shtml].
- *U.C.T.*, Book review of *L.E. Reichl*, “A Modern Course in Statistical Physics”, *J. Stat. Phys.* **141**, 609 – 611 (2010).
- *P. Calabrese, P. Fendley, and U.C.T.*, “Preface: John Cardy’s scale-invariant journey in low dimensions: a special issue for his 70th birthday”, *J. Phys. A: Math. Theor.* **51**, 280301 – 1-4 (2018).
- *N. Ghaffarzadegan, L. Childs, and U.C.T.*, “Diverse computer simulation models provide unified lessons on university operation during a pandemic”, *BioScience* **71**, 113 – 114 (2021).
- *U.C.T.*, “Editorial: Moving an interdisciplinary journal forward”, *Phys. Rev. E* **103**, 040001 – 1 (2021).
- *J.M. Rost, T. Pattard, U.C.T., D.J. Bukman, R. D’Souza, J.-W. Pan, N. Spaldin, and J.-J. Liétor-Santos*, “Editorial: Introducing Perspective articles”, *Phys. Rev. E* **105**, 040001 – 1 (2022).

Theses

- “*Elastische Phasenübergänge zweiter Ordnung in inhomogenen Medien* (Second-order elastic phase transitions in inhomogeneous media)”, Diploma thesis, TU München (1988).
- “*Koexistenzanomalien in der Dynamik isotroper Systeme* (Coexistence anomalies in the dynamics of isotropic systems)”, Dissertation, TU München (1992).
- “*Phasenübergänge und Skalenverhalten in Nichtgleichgewichtssystemen* (Phase transitions and scaling behavior in non-equilibrium systems)”, Habilitation thesis, TU München (1998).

Invited Lectures at Summer / Winter Schools and Workshops

- “Field theory approaches to nonequilibrium dynamics”, two lectures, Summer school “Ageing and the Glass Transition”, Luxembourg (Luxembourg), September 2005.
- “Field-theoretic approaches to interacting particle systems”, three lectures, Workshop “Non-Equilibrium Dynamics of Interacting Particle Systems” within the program “Principles of Non-Equilibrium Dynamics”, Isaac Newton Institute for Mathematical Sciences, Cambridge (U.K.), April 2006.
- “Fluctuations and correlations in complex systems – An introduction to stochastic nonlinear dynamics”, five lectures and student projects, Second Annual French Complex Systems Summer School, Institut des Systèmes Complexes (ISC), École Normale Supérieure Paris (France), August 2008.
- “Renormalization group: Applications in statistical physics”, four lectures, Schladming International Winter School “Physics at All Scales: The Renormalization Group”, Schladming (Austria), February / March 2011.
- “Stochastic dynamics”, one-day lecture series, Erasmus Mundus Master Program, École Polytechnique, Palaiseau (France), October 2012.
- “Field theory approach to equilibrium critical phenomena”,
 - three lectures, Second Workshop on Statistical Physics, Bogotá (Colombia), September 2014;
 - three lectures, Conference “Renormalization Methods in Statistical Physics and Lattice Field Theories”, Montpellier (France), August 2015.
- “Critical dynamics”,
 - five lectures, Bangalore School on Statistical Physics VIII, International Centre for Theoretical Sciences (ICTS) Bangalore (India), July 2017;
 - four lectures, Universidade de Lisboa, Lisbon (Portugal), June 2019.

- “Fluctuation effects and pattern formation in population dynamics”,
 - three lectures, Higgs Centre for Theoretical Physics, University of Edinburgh (U.K.), September 2019;
 - two lectures, Scuola Internazionale Superiore di Studi Avanzati (International School for Advanced Studies, SISSA, Italy), November 2019.
- “Raumzeitliche Korrelationen in stochastischer Populationsdynamik (Spatio-temporal correlations in stochastic population dynamics)”, lecture, 11. Theoretikerworkshop der jDPG (Young German Physical Society) “Stochastische Modelle in der Physik (Stochastic Models in Physics)” (virtual), January 2021.
- “Open problems in classical non-equilibrium criticality and scaling”, invited short presentation (virtual), informal discussion with J. Garrahan, N. Goldenfeld, I. Procaccia, G. Tarjus, moderated by J. Marino, KITP Program “Non-Equilibrium Universality: From Classical to Quantum and Back”, October 2021.
- “Fluctuation effects and pattern formation in chemical reactions, population dynamics, and epidemic spreading”, three lectures, Basque Centre for Applied Mathematics (BCAM) MME Course, Bilbao, May 2024.

Invited Colloquia and Seminar Talks

- “Coexistence anomalies in the dynamics of isotropic systems”, Theoretical physics colloquium, TU München (Germany), December 1991.
- “Kinetic roughening of growing surfaces – New RG results”, MSC extended dynamics seminar, Cornell University, Ithaca, NY, July 1994.
- “Correlated pinning of flux lines to columnar defects and transport in the Bose glass phase”,
 - NFL seminar series, Massachusetts Institute of Technology, Cambridge, MA, April 1995;
 - Special theory seminar, Cornell University, Ithaca, NY, May 1995;
 - Condensed matter theory seminar, Harvard University, Cambridge, MA, May 1995.

- “Localized flux lines and the Bose glass”,
 - Condensed matter theory seminar, University of Oxford (U.K.), November 1995;
 - Theoretical physics seminar, University of Manchester (U.K.), February 1996;
 - Superconductivity seminar, Imperial College London (U.K.), March 1996;
 - Condensed matter theory seminar, Birmingham University (U.K.), March 1996;
 - Condensed matter seminar, University of Southampton (U.K.), May 1996;
 - Seminar, Johns Hopkins University, Baltimore, MD, March 1998;
 - Colloquium, Virginia Tech, Blacksburg, VA, March 1998;
 - Seminar, University of Rochester, Rochester, NY, April 1998;
 - Solid state seminar, University of Virginia, Charlottesville, VA, September 1999.
- “Renormalized field theory for branching and annihilating random walks”,
Statistical physics seminar, Eötvös University Budapest (Hungary), April 1996.
- “Columnar defects and localized flux lines”,
 - Superconductivity seminar, Universität Hamburg (Germany), October 1996;
 - Interdisciplinary solid state physics seminar, TU München (Germany), May 1998;
 - SFB seminar Universität-GHS Essen (Germany), November 1998.
- “Critical behavior of the non-equilibrium SSS model”,
T34 seminar, TU München (Germany), January 1997.
- “Dynamic phase transitions in diffusion-limited chemical reactions”,
 - Theoretical physics colloquium, TU München (Germany), January 1997;
 - SFB seminar, Heinrich-Heine-Universität Düsseldorf (Germany), May 1997;

- IFF theory seminar, Forschungszentrum Jülich (Germany), May 1997;
- Statistical physics / condensed matter theory seminar, Georg-August-Universität Göttingen (Germany), June 1997.
- “Flux lines in superconductors – or How to pin spaghetti”, Linacre seminar, Linacre College, Oxford (U.K.), March 1997.
- “Weakly pinned Bose glass vs Mott insulator phase in superconductors”, Condensed matter theory family bag lunch meeting, Harvard University, Cambridge, MA, March 1998.
- “Branching and annihilating random walks”,
 - Condensed matter theory seminar, Harvard University, Cambridge, MA, March 1998;
 - University of Rochester, Rochester, NY, April 1998.
- “Dynamic phase transitions in diffusion-limited reactions”,
 - Statistical physics seminar, Martin-Luther-Universität Halle (Germany), May 1998;
 - Condensed matter theory seminar, Harvard University, Cambridge, MA, October 2001.
- “On the physics of dinosaurs”,
 - Habilitation colloquium, TU München (Germany), July 1999;
 - Colloquium, Virginia Tech, Blacksburg, VA, September 1999;
 - Colloquium, University of Iowa, Iowa City, IA, November 1999.
- “Driven interfaces, Burgers hydrodynamics, directed polymers: Field theory approach to the KPZ problem”,
 - Solid state lunch seminar, University of Iowa, Iowa City, IA, November 1999;
 - Condensed matter seminar, University of Pittsburgh, Pittsburgh, PA, December 2000;
 - Statistical physics seminar, Martin-Luther-Universität Halle (Germany), June 2001.

- “Flux lines and columnar defects in high- T_c superconductors”,
 - Colloquium, Eberhard-Karls-Universität Tübingen (Germany), June 2000.
 - Soft matter seminar, Arizona State University, Tempe, AZ, April 2004.
- “Critical dynamics at the liquid-gas phase transition (binary liquids): Influence of non-equilibrium perturbations”, T34 seminar, TU München (Germany), July 2000.
- “Critical dynamics: Influence of non-equilibrium perturbations”, Theory colloquium, Universität-GHS Essen (Germany), June 2001.
- “Scale invariance and phase transitions in diffusion-limited reactions”,
 - Colloquium, Virginia Tech, Blacksburg, VA, February 2003;
 - Colloquium, University of Missouri, Rolla, MO, January 2004.
- “Multispecies pair annihilation processes”,
 - Seminar, Eberhard-Karls-Universität Tübingen (Germany), June 2003;
 - Statistical physics seminar, Martin-Luther-Universität Halle (Germany), July 2003.
- “Fluctuations and correlations in stochastic lattice models for predator–prey interactions”,
 - Theoretical physics seminar, Rudolf Peierls Centre for Theoretical Physics, University of Oxford (U.K.), October 2005;
 - Condensed matter theory seminar, Arnold Sommerfeld Center for Theoretical Physics, Ludwig-Maximilians-Universität München (Germany), December 2005;
 - Cambridge computer modelling in biology group seminar, Cambridge University, Cambridge (U.K.), March 2006;
 - Science of complex networks seminar, Network Dynamics and Simulation Science Laboratory, Virginia Bioinformatics Institute, Blacksburg, VA, June 2006.
- “Current distribution in driven diffusive systems: field theory approach”, The forum seminar, Rudolf Peierls Centre for Theoretical Physics, University of Oxford (U.K.), November 2005.

- Special Sommerfeld Lectures “Diffusion-limited reactions and Fock representation of interacting particle systems”, two lectures, Arnold Sommerfeld Center for Theoretical Physics, Ludwig-Maximilians-Universität München (Germany), December 2005.
- “Fluctuations and correlations in multispecies pair annihilation processes”, Seminar, University of Minnesota, Minneapolis, MN, October 2006.
- “Erratic rabbits and gambling foxes: stochastic predator-prey models”, Colloquium, Virginia Tech, Blacksburg, VA, August 2007.
- “Stochastic predator-prey models: population oscillations, spatial correlations, and the effect of randomized rates”,
 - Colloquium, Emory University, Atlanta, GA, September 2011;
 - Soft matter / biophysics lunch seminar, Ludwig-Maximilians-Universität München (Germany), July 2012;
 - ISC-PIF seminar, Institut des Systèmes Complexes – Paris Île-de-France, Paris (France), November 2012;
 - Mathematical biology and medicine seminar, University of Leeds (U.K.), November 2012;
 - Theoretical physics seminar, University Duisburg-Essen (Germany), December 2012.
- “Dynamics of magnetic flux lines in disordered type-II superconductors”, Materials science and engineering seminar, Virginia Tech, Blacksburg, VA, March 2012.
- “Non-equilibrium relaxation and aging kinetics”,
 - Theoretical condensed matter seminar, Rudolf Peierls Centre for Theoretical Physics, University of Oxford (U.K.), November 2012;
 - Sommerfeld theory colloquium, Arnold Sommerfeld Center for Theoretical Physics, Ludwig-Maximilians-Universität München (Germany), December 2012.
- “Non-equilibrium relaxation and aging scaling in driven systems”, Condensed matter seminar, Michigan State University, East Lansing, MI, October 2016.
- “Stochastic spatial predator-prey models: population oscillations, predator extinction, and the effects of randomness and evolution”, Theoretical sciences unit seminar, Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bangalore (India), July 2017.

- “Temperature interfaces in the Katz–Lebowitz–Spohn driven lattice gas”,
 - Informal statistical physics seminar, University of Maryland, College Park, MD, April 2019;
 - Statistical physics and complexity seminar, University of Edinburgh (U.K.), September 2019;
 - Leeds applied nonlinear dynamics (LAND) seminar, University of Leeds (U.K.), October 2019;
 - DAMTP statistical physics and soft matter seminar, University of Cambridge (U.K.), October 2019;
 - Theory colloquium, Universität zu Köln (Germany), October 2019;
 - Joint SISSA / ICTP seminar, SISSA Trieste (Italy), November 2019.

- “Stochastic spatial predator-prey models”,
 - Colloquium, Universidade de Lisboa, Lisbon (Portugal), May 2019;
 - Colloquium, Universidade do Minho, Braga (Portugal), June 2019;
 - Seminar, Swiss Federal Institute of Aquatic Science and Technology Eawag, Dübendorf (Switzerland), September 2019;
 - Joint applied mathematics and math-bio seminar, University of Leeds (U.K.), October 2019;
 - Theorie 1 seminar, Friedrich-Alexander-Universität Erlangen-Nürnberg (Germany), October 2019;
 - Soft matter / biophysics lunch seminar, Ludwig-Maximilians-Universität München (Germany), October 2019;
 - Theory Club Seminar (online), Laboratoire Matière et Systèmes Complexes, Université de Paris (France), March 2021;
 - International Webinar on Physics (online), Pabna University of Science and Technology (Bangladesh), June 2021.

- “Nucleation and aging transient dynamics in the two-dimensional complex Ginzburg–Landau Equation”,
 LPMMC seminar, CNRS, Grenoble (France), August 2019.

Invited Conference Talks

- “Localized flux lines and the Bose glass”,
MECO 21, “21st Seminar of the Middle-European Cooperation in Statistical Physics”, Bled (Slovenia), April 1996.
- “Field theory of branching and annihilating random walks”,
KFKI Workshop “Recent Developments in Non-Equilibrium Statistical Physics”, KFKI Budapest (Hungary), September 1997.
- “The Coulomb glass problem”,
Dagstuhl seminar “Algorithmic Techniques in Physics”,
Schloss Dagstuhl, Wadern (Germany), December 1997.
- “Dynamic phase transitions in diffusion-limited reactions”,
 - MECO 23, “23rd Seminar of the Middle-European Cooperation in Statistical Physics”, Trieste (Italy), April 1998;
 - RG02, “5th International Conference Renormalization Group 02”,
Tatranska Strba (Slovakia), March 2002.
- “Scale invariance and dynamic phase transitions in diffusion-limited reactions”,
German Physical Society (DPG) Spring Meeting, Dresden (Germany),
March 2003.
- “Multispecies pair annihilation”,
Seminar “Non-Equilibrium Statistical Physics in Low Dimensions and Reaction Diffusion Systems”, Max-Planck-Institut für Physik komplexer Systeme, Dresden (Germany), October 2003.
- “Fluctuations in biological systems: population dynamics and receptor-ligand interactions”,
WOMT04, NSF Workshop on “Opportunities in Materials Theory”,
Arlington, VA, October 2004.
- “The role of stochastic fluctuations and spatio-temporal correlations in lattice models for predator–prey interactions”,
Workshop on “Applications of Methods of Stochastic Systems and Statistical Physics in Biology”, University of Notre Dame, Notre Dame, IN, October 2005.
- “Fluctuations and correlations in multispecies pair annihilation processes”,
ASC Workshop “Nonequilibrium Phenomena in Classical and Quantum Systems, Arnold Sommerfeld Center for Theoretical Physics,
Ludwig-Maximilians-Universität München (Germany), October 2006.

- “Current distribution in driven diffusive systems: field theory approach”, 97th Statistical Mechanics Conference, Rutgers, NJ, May 2007.
- “Stochastic predator-prey models: population oscillations, spatial correlations, and the effect of randomized rates”,
 - Seminar “Many-Body Systems Far From Equilibrium: Fluctuations, Slow Dynamics and Long-Range Interactions”, Max-Planck-Institut für Physik komplexer Systeme, Dresden (Germany), February 2009;
 - EPSRC Workshop “Non-equilibrium Dynamics of Spatially Extended Interacting Particle Systems”, Warwick (U.K.), January 2010.
- “Stochastic predator-prey models: spatial variability enhances species fitness”, APS March Meeting, Pittsburgh, PA, March 2009.
- “Stochastic fluctuations and emerging correlations in simple reaction-diffusion systems”, IPAM Workshop “Simulation Hierarchies for Climate Modeling”, Institute for Pure and Applied Mathematics, UCLA, Los Angeles, CA, May 2010.
- “Stochastic population oscillations in spatial predator-prey models”,
 - 12th International Symposium “Continuum Models and Discrete Systems” (CMDS 12), Saha Institute of Nuclear Physics, Kolkata (India), February 2011;
 - 78th Annual SESAPS Meeting, Roanoke, VA, October 2011.
- “Environmental versus demographic variability in stochastic lattice predator-prey models”,
 - STATPHYS 25, “25th IUPAP International Conference on Statistical Physics”, Seoul, South Korea, July 2013;
 - APS March Meeting, Denver, CO, March 2014;
 - Second Workshop on Statistical Physics, Bogotá (Colombia), September 2014.
- “Critical dynamics in driven-dissipative Bose-Einstein condensation”, Conference “Renormalization Methods in Statistical Physics and Lattice Field Theories”, Montpellier (France), August 2015.

- “Aging scaling in driven systems”,
STATPHYS 26 Statistical Physics Conference Satellite “Nonequilibrium Dynamics in Classical and Quantum Systems: From Quenches to Slow Relaxations”, Pont-à-Mousson (France), July 2016.
- “Non-equilibrium relaxation of driven topological defects”,
83rd Annual SESAPS Meeting, Charlottesville, VA, November 2016.
- “Non-equilibrium relaxation and aging scaling in driven systems”,
 - 116th Statistical Mechanics Conference, Rutgers University, New Brunswick, NJ, December 2016;
 - Workshop “Nonequilibrium Dynamics: Diffusion, Populations and Aging”, TIFR Centre for Interdisciplinary Sciences (TCIS), Hyderabad (India), June 2017;
 - Research Seminar, Bangalore School on Statistical Physics VIII, International Centre for Theoretical Sciences (ICTR) Bangalore (India), July 2017.
- “Spatially extended stochastic rock-paper-scissors and May–Leonard models”,
SIAM Conference on Applications of Dynamical Systems (SIAM-DS19), Snowbird, UT, May 2019.
- “Non-equilibrium relaxation and critical aging of flux lines following current quenches”,
 - 15th International Workshop on “Magnetism and Superconductivity at the Nanoscale”, Coma-ruga (Spain), July 2019;
 - Discussion Meeting of the EPSRC NetworkPlus on Emergence and Physics Far From Equilibrium on “Horizons for Emergence and Non-Equilibrium Physics”, King’s College London (U.K.), September 2019;
 - 7th International Conference on Superconductivity and Magnetism (ICSM2020), Bodrum (Turkey), April 2020; conference postponed to 2021 due to the COVID-19 pandemic; delivered in virtual format October 2021.
- “Temperature interfaces in the Katz-Lebowitz-Spohn driven lattice gas”,
 - Workshop “The Many Facets of Non-Equilibrium Physics: From Many-Body Theory to Quantum Thermodynamics”, Mazara del Vallo, Sicily (Italy), July 2019;
 - * 123rd Statistical Mechanics Conference, Rutgers University, Piscataway, NJ, May 2020; conference postponed due to the COVID-19 pandemic.

- “Understanding the control process for non-equilibrium systems using scaling theory”, delivered by postdoc Dr. Priyanka,
 - * APS March Meeting, Denver, CO, March 2020; conference canceled due to the COVID-19 pandemic; invited talk postponed to 2021 APS March Meeting;
 - * Conference “Fluctuations in Nonequilibrium Systems: Theory and Applications”, International Centre for Theoretical Sciences (ICTS) Bangalore (India), March 2020; conference canceled due to the COVID-19 pandemic.
- “Control of the surface roughness during a growth process described by the Kardar–Parisi–Zhang equation”, delivered by postdoc Dr. Priyanka, APS March Meeting (online), March 2021.
- “Spatially inhomogeneous stochastic cyclic competition models: Stabilizing vulnerable ecologies through immigration waves”,
 - SIAM Conference on the Life Sciences (SIAM-LS22), Pittsburgh, PA, July 2022;
 - Chinese Physical Society (CPS) Fall Meeting 2022, Symposium on Statistical Physics and Complex Systems (online), November 2022;
 - 124th Statistical Mechanics Conference, Rutgers University, Piscataway, NJ, May 2023;
 - XLIII Dynamics Days Europe 2023, Naples (Italy), September 2023.
- “Stochastic spatial Lotka–Volterra predator-prey models”, Ising Lectures 2023, Lviv (Ukraine), May 2023.
- “Statistical physics tools applied to stochastic models in population dynamics and epidemic spreading”, 15th Conference on Dynamical Systems Applied to Biology and Natural Sciences (DSABNS), Caparica (Portugal), February 2024.
- “Computing macroscopic reaction rates in reaction-diffusion systems using Monte Carlo simulations”, delivered by Ph.D. student Mohamed Swailem, 15th Conference on Dynamical Systems Applied to Biology and Natural Sciences (DSABNS), Caparica (Portugal), February 2024.

- “Effects of lattice dilution on the nonequilibrium phase transition in the stochastic SIR model”, delivered by former Ph.D. student Ruslan Mukhamadiarov, 15th Conference on Dynamical Systems Applied to Biology and Natural Sciences (DSABNS), Caparica (Portugal), February 2024.
- “Stochastic population dynamics of competing species in driven and/or spatially inhomogeneous systems”, Leeds 2024 Eco-Evolutionary Dynamics (L24EEDs) Workshop on “Mathematical Modelling of Microbial Communities: Cooperation, Dynamics and Resistance”, Leeds (U.K.), July 2024
- “Boundary influx prevents fixation / extinction in spatially extended stochastic population dynamics with cyclic and hierarchical domination”, XLIV Dynamics Days Europe 2024, Bremen (Germany), July 2024.

Other Invited Conference Events

- “Physical Review Journals – Editors Chat”, invited discussion panel (virtual) with R. Dickman, H. Chaté, C. Antoneodo, and R. D’Souza, Encontro Nacional de Física Estatística / Brazilian Meeting on Statistical Physics (ENFE 2021), November 2021.

Main Conference Talks

- “Influence of defects on the statics and dynamics of structural phase transitions”, DFG meeting “Magnetic Resonance and the Investigation of Structures in and on Solids”, Hirschegg (Germany), September 1990.
- “Defect-induced condensation and central peak at structural phase transitions”, Neutron Research Group meeting, Bad Schandau (Germany), April 1992.
- “Structural phase transitions with randomly distributed defects: Local condensation, inhomogeneous order parameter, and central peak”, NATO Advanced Study Institute “Phase Transitions and Relaxation in Systems with Competing Energy Scales”, Geilo (Norway), April 1993.
- “Localized flux lines and the Bose glass”, XIV Sitges Conference “Complex Behaviour of Glassy Systems”, Sitges-Barcelona (Spain), June 1996.

- “Theory of branching and annihilating random walks”,
Workshop “Dynamics of Non-Equilibrium Systems”, International
Centre for Theoretical Physics Trieste (Italy), August 1996.
- “Surprises with anisotropic variants of the KPZ equation”,
Eötvös School and Workshop “Phase Separation in Physics, Chemistry,
and Biology”, Budapest (Hungary), July 2000.
- “Fluctuations in biological systems”,
NSF Workshop on the “Role of Theory in Biological Physics and Ma-
terials”, Tempe, AZ, May 2004.
- “Non-equilibrium relaxation and aging scaling of magnetic flux lines in
disordered type-II superconductors”,
U.S. Department of Energy Theoretical Condensed Matter Physics
Principal Investigators’ Meeting 2012, Rockville, MD, August 2012.
- “Control of universal scaling, noise strength, and pattern formation in
critical dynamics”,
U.S. Army Research Office Workshop on “Statistical Physics of Stocha-
stic Optimal Control and Learning”, Atlanta, GA, June 2016.
- “Relaxation Processes in Systems of Interacting Skyrmions”,
U.S. Department of Energy Theoretical Condensed Matter Physics
Principal Investigators’ Meeting, Gaithersburg, MD, August 2018.

Contributed Conference Talks and Posters

- DPG Spring Meeting, Münster (Germany), March 1987.
- ICM 88, “International Conference on Magnetism”, Paris (France),
July 1988.
- PHONONS 89, “3rd International Conference on Phonon Physics and
6th International Conference on Phonon Scattering in Condensed Mat-
ter”, Heidelberg (Germany), August 1989.
- DPG Spring Meeting, Regensburg (Germany), March 1990.
- MECO 18, “18th Seminar of the Middle-European Cooperation in
Statistical Physics”, Duisburg (Germany), March 1991.
- DPG Spring Meeting, Münster (Germany), April 1991.
- XXIst European Symposium “Dynamical Properties of Solids”,
Autrans (France), September 1991.

- DPG Spring Meeting, Regensburg (Germany), March 1992.
- STATPHYS 18, “18th IUPAP International Conference on Statistical Physics”, Berlin (Germany), August 1992.
- 13th General Conference of the Condensed Matter Division of the EPS and DPG Spring Meeting, Regensburg (Germany), March 1993.
- Neutron Research Group meeting, Benediktbeuren (Germany), October 1993.
- APS March Meeting, Pittsburgh, PA, March 1994.
- MECO 19, “19th Seminar of the Middle-European Cooperation in Statistical Physics”, Smolenice (Poland), April 1994.
- MRS Fall Meeting, Boston, MA, November 1994.
- DPG Spring Meeting, Berlin (Germany), March 1995.
- Workshop “Vortex Dynamics”, Lake Forest, IL, June 1995.
- Gordon Research Conference “Condensed Matter Physics”, Wolfeboro, NH, July 1995.
- DPG Spring Meeting, Regensburg (Germany), March 1996.
- 3rd Liquid Matter Conference, Norwich (U.K.), July 1996.
- International Workshop “Vortex Matter in High-Temperature Superconductors”, Ascona (Switzerland), June 1997.
- International Summer School “Fundamental Problems in Statistical Mechanics IX”, Altenberg (Germany), August 1997.
- Adriatico Research Conference “The Dynamics of Complexity”, International Centre for Theoretical Physics Trieste (Italy), August 1997.
- DPG Spring Meeting, Regensburg (Germany), March 1998.
- Satellite Meeting to STATPHYS 20, “Applications of Field Theory to Statistical Physics: Soft-Condensed Matter, Non-Equilibrium and Boundary Critical Phenomena”, Bonn (Germany), July 1998.
- DPG Physics School “Collective Transport in Disordered Media”, Physikzentrum Bad Honnef (Germany), September 1998.
- MECO 24, “24th Seminar of the Middle-European Cooperation in Statistical Physics”, Wittenberg (Germany), March 1999.

- DPG Spring Meeting, Münster (Germany), March 1999.
- APS Centennial March Meeting, Atlanta, GA, March 1999.
- 2nd Annual Greater Boston Area Statistical Mechanics Meeting, Brandeis University, Waltham, MA, October 2000.
- 2001 Boulder School “Condensed Matter and Materials Physics”, Boulder, CO, July 2001.
- 3rd Annual Greater Boston Area Statistical Mechanics Meeting, Brandeis University, Waltham, MA, October 2001.
- STATPHYS-Kolkata IV, “International Conference on Statistical Physics”, Kolkata (India), January 2002.
- DPG Spring Meeting, Regensburg (Germany), March 2002.
- APS March Meeting, Indianapolis, IN, March 2002.
- 88th Statistical Mechanics Conference, Rutgers, NJ, December 2002.
- APS March Meeting, Austin, TX, March 2003.
- International Conference of Physics Students (ICPS), Odense (Denmark), August 2003.
- STATPHYS 22, “22nd IUPAP International Conference on Statistical Physics”, Bangalore (India), July 2004.
- APS March Meeting, Los Angeles, CA, March 2005.
- ECMTB 05, “European Conference on Mathematical and Theoretical Biology”, Dresden (Germany), July 2005.
- 94th Statistical Mechanics Conference, Rutgers, NJ, December 2005.
- 21st General Conference of the Condensed Matter Division of the EPS and DPG Spring Meeting, Dresden (Germany), March 2006.
- DPG Spring Meeting, Regensburg (Germany), March 2007.
- 97th Statistical Mechanics Conference, Rutgers, NJ, May 2007.
- DPG Spring Meeting, Berlin (Germany), February 2008.
- APS March Meeting, New Orleans, LO, March 2008.

- MECO 23, “23rd Seminar of the Middle-European Cooperation in Statistical Physics”, Puchberg/Wels (Austria), April 2008.
- Symposium “Complexity in Materials far from Equilibrium”, Blacksburg, VA, May 2008.
- APS March Meeting, Pittsburgh, PA, March 2009.
- Boulder School for Condensed Matter and Materials Physics “Nonequilibrium Statistical Mechanics: Fundamental Problems and Applications”, Boulder, CO, July 2009.
- First WLVT Research Symposium “Applications of Statistical Mechanics to Far-from Equilibrium and Biological Systems”, Washington & Lee University, Lexington, VA, June 2010.
- ICTAS Research Day 2010, Virginia Tech, Blacksburg, VA, September 2010.
- Symposium “Complex Driven Systems: From Statistical Physics to Life Sciences”, Blacksburg, VA, October 2010.
- APS March Meeting, Dallas, TX, March 2011.
- ICTAS Spring Meeting 2011, Virginia Tech, Blacksburg, VA, April 2011.
- Second WLVT Research Symposium “Applications of Statistical Mechanics to Far-from Equilibrium and Biological Systems”, Washington & Lee University, Lexington, VA, July 2011.
- 78th Annual SESAPS Meeting, Roanoke, VA, October 2011.
- APS March Meeting, Boston, MA, February/March 2012.
- 79th Annual SESAPS Meeting, Tallahassee, FL, November 2012.
- APS March Meeting, Baltimore, MD, March 2013.
- Oxford Conference on Challenges in Applied Mathematics, Oxford (U.K.), July 2013.
- STATPHYS 25, 25th IUPAP International Conference on Statistical Physics, Seoul (South Korea), July 2013.
- 80th Annual SESAPS Meeting, Bowling Green, KY, November 2013.
- Soft Matter Workshop, James Madison University, Harrisonburg, VA, February 2014.

- APS March Meeting, Denver, CO, March 2014.
- U.S. Department of Energy 2014 Theoretical Condensed Matter Physics Principal Investigators' Meeting, Gaithersburg, MD, August 2014.
- Soft Matter Workshop, Virginia Tech, Blacksburg, VA, October 2014.
- 81st Annual SESAPS Meeting, Columbia, SC, November 2014.
- APS March Meeting, San Antonio, TX, March 2015.
- 9th q-bio (quantitative biology) Conference, Virginia Tech, Blacksburg, VA, August 2015.
- 3rd Soft Matter Workshop, University of Virginia, Charlottesville, VA, November 2015.
- 82nd Annual SESAPS Meeting, Mobile, AL, November 2015.
- APS March Meeting, Baltimore, MD, March 2016.
- Center for Soft Matter and Biological Physics Symposium, Blacksburg, VA, May 2016.
- STATPHYS 26 Statistical Physics Conference Satellite “Nonequilibrium Dynamics in Classical and Quantum Systems: From Quenches to Slow Relaxations”, Pont-à-Mousson (France), July 2016.
- STATPHYS 26, 26th IUPAP International Conference on Statistical Physics, Lyon (France), July 2016.
- U.S. Department of Energy 2016 Theoretical Condensed Matter Physics Principal Investigators' Meeting, Gaithersburg, MD, August 2016.
- 83rd Annual SESAPS Meeting, Charlottesville, VA, November 2016.
- APS March Meeting, New Orleans, LO, March 2017.
- Molecular Biophysics Symposium, Blacksburg, VA, April 2017.
- Center for Soft Matter and Biological Physics Symposium, Blacksburg, VA, May 2017.
- 18th International Conference on Systems Biology (ICSB 2017), Blacksburg, VA, August 2017.
- Center for Soft Matter and Biological Physics Symposium, , Blacksburg, VA, May 2018.

- Virginia Tech Annual Summer Undergraduate Research Symposium, Blacksburg, VA, July 2018.
- U.S. Department of Energy 2018 Theoretical Condensed Matter Physics Principal Investigators' Meeting, Gaithersburg, MD, August 2018.
- 5th Soft Matter Workshop, Virginia Tech, Blacksburg, VA, September 2018.
- Virginia Tech Family Weekend Academic Showcase, Blacksburg, VA, October 2018.
- 85th Annual SESAPS Meeting, Knoxville, TN, November 2018.
- APS March Meeting, Boston, MA, March 2019.
- Center for Soft Matter and Biological Physics Symposium, Blacksburg, VA, May 2019.
- 11th Annual Summer School on Soft Solids and Complex Fluids, Amherst, MA, June 2019.
- 15th International Workshop on "Magnetism and Superconductivity at the Nanoscale", Coma-ruga (Spain), July 2019.
- Workshop "The many facets of non-equilibrium physics: from many-body theory to quantum thermodynamics", Mazara del Vallo, Sicily (Italy), July 2019.
- * APS March Meeting, Denver, CO, March 2020; conference canceled due to the COVID-19 pandemic.
- Center for Soft Matter and Biological Physics Symposium, Blacksburg, VA, May 2020; conference held online due to the COVID-19 pandemic.
- APS March Meeting (online), March 2021.
- Center for Soft Matter and Biological Physics Symposium (online), Blacksburg, VA, May 2021.
- APS March Meeting, Chicago, IL, March 2022.
- Center for Soft Matter and Biological Physics Symposium, Blacksburg, VA, May 2022.
- APS March Meeting, Las Vegas, NV, March 2023.
- Center for Soft Matter and Biological Physics and Oak Ridge National Lab Symposium, Blacksburg, VA, May 2023.

- APS March Meeting, Minneapolis, MN, March 2024.
- 2024 Virginia Academy of Science (VAS) Annual Spring Meeting, Fredericksburg, VA, May 2024.

External Research Funding as Postdoctoral Researcher

- Postdoctoral Fellowship from the *Deutsche Forschungsgemeinschaft* (DFG Ta 177/1-1,2), 1993 – 1995.
- European Commission Training and Mobility of Researchers (TMR) Marie Curie Fellowship (EU Contract ERB FMBI-CT96-1189), 1996 – 1997.
- *Habilitation* Fellowship from the *Deutsche Forschungsgemeinschaft* and travel grant (DFG Ta 177/2-1,2), 1997 – 1998.

External Research Funding at Virginia Tech

- National Science Foundation research grant (NSF DMR-0075725)
“Phase transitions and scaling in non-equilibrium systems”;
with REU (research experience for undergraduates) supplement, PI,
May 2000 – July 2003, \$ 170,000.
- Bank of America Jeffress Memorial Trust research grant (J-594)
“Scaling and universality in non-equilibrium systems”, PI,
January 2001 – December 2003, \$ 49,232.
- National Science Foundation research grant (NSF DMR-0308548)
“Scale invariance and dynamic phase transitions in non-equilibrium
systems”, PI, July 2003 – June 2007, \$ 240,000.
- National Science Foundation conference grant (NSF DMR-0405057)
“Symposium: Biological systems and soft materials: Future directions
in statistical physics”,
co-PI with PI B. Schmittmann, February 2004, \$ 8,000.
- National Science Foundation conference grant (NSF DMR-0757181)
“Complexity in materials far from equilibrium Conference”,
PI, with co-PI M. Pleimling, May 2008, \$ 5,200.
- Department of Energy research grant (BES DE-FG02-09ER46613)
“Driven magnetic flux lines in disordered superconductors: Relaxation
towards equilibrium and nonequilibrium stationary states”, PI (50 %),
with co-PI M. Pleimling (50 %), August 2009 – August 2012, \$ 450,000.
- Department of Energy renewal grant (BES DE-FG02-09ER46613)
“Non-equilibrium relaxation and aging scaling of magnetic flux lines in
disordered type-II superconductors”, PI (50 %),
with co-PI M. Pleimling (50 %), August 2012 – August 2015, \$ 450,000.
- Army Research Office STIR grant (67526-EG-II)
“Toward control of universal scaling in critical dynamics”, PI (34 %),
with co-PIs M. Pleimling (33 %) and D. Stilwell (33 %),
May – November 2015, \$ 41,802.
- Department of Energy renewal grant (BES DE-FG02-09ER46613)
“Non-equilibrium relaxation and aging scaling of driven topological
defects in condensed matter”, PI (50 %),
with co-PI M. Pleimling (50 %), August 2015 – August 2018, \$ 450,000.

- Army Research Office grant (W911NF-17-1-0156)
 “Control of universal scaling, noise strength, and pattern formation in critical dynamics”, PI (50 %),
 with co-PI M. Pleimling (50 %), and subcontract to P.S. Krishnaprasad (University of Maryland), April 2017 – August 2022, \$ 1,654,294;
 Undergraduate Research Apprenticeship Program (URAP) supplements,
 ARO Broad Agency Announcement (BAA), May – August 2018, \$ 9,000;
 May – August 2019; \$ 4,500; * May – August 2020, \$ 9,000, deferred to 2021 due to the COVID-19 pandemic; \$ 9,000, May – August 2021.
- Department of Energy renewal grant (BES DE-FG02-09ER46613)
 “Non-equilibrium relaxation, aging scaling, and critical depinning dynamics of skyrmions in disordered magnetic films”, PI (50 %), with co-PI M. Pleimling (50 %), August 2018 – December 2021, \$ 450,000.
- Engineering and Physical Sciences Research Council (EPSRC) & National Science Foundation grant (EP/V014439/1 & NSF DMS-2128587)
 “Eco-evolutionary dynamics of fluctuating populations”, PI (50 %), with co-PI Michel Pleimling (50 %), August 2021 – August 2024, \$ 300,000; and with PIs Mauro Mobilia and Alastair Rucklidge (Department of Applied Mathematics, University of Leeds, U.K.), £ 443,468.

Teaching and Advising

Lecture Courses at Virginia Tech

Students' evaluations rating scale until spring 2011: 1 – 4 (excellent):

- Undergraduate “Thermal Physics” (PHYS 3704), spring semester 1999, 31 students, overall rating by 17 responders: 3.8.
- Graduate “Independent Study: Quantum Field Theory” (PHYS 5974), spring semester 1999, 1 student (no rating).
- Graduate “Statistical Mechanics” (PHYS 5705), fall semester 1999, 5 students, overall rating: 3.8.
- Undergraduate “Thermal Physics” (PHYS 3704), spring semester 2000, 16 students, overall rating by 12 responders: 4.0.
- Graduate “Special Study: Superconductivity” (PHYS 5984), spring and fall semesters 2000, 5 students (no rating).
- Graduate “Statistical Mechanics” (PHYS 5705), fall semester 2000, 12 students, overall rating by 10 responders: 4.0.
- Undergraduate “Thermal Physics” (PHYS 3704), spring semester 2001, 20 students, overall rating by 12 responders: 3.8.
- Graduate “Special Study: Non-Equilibrium Statistical Mechanics” (PHYS 5984), spring semester 2001, 3 students, overall rating: 4.0.
- Undergraduate “Foundations of Physics I – Part 1” (PHYS 2305), fall semester 2001, 68 students, overall rating by 53 responders: 2.9.
- Undergraduate “Special Study: Freshman Physics Seminar” (PHYS 2984), fall semester 2001, 18 students, overall rating by 14 responders: 3.4.
- Undergraduate “Foundations of Physics I – Part 1” (PHYS 2305), spring semester 2002, 92 students, overall rating by 63 responders: 2.9.
- Graduate “Statistical Mechanics” (PHYS 5705), fall semester 2002, 4 students, overall rating: 4.0.
- Graduate “Advanced Solid State Physics II” (PHYS 6556), spring semester 2003, 2 students, overall rating: 4.0.
- Graduate “Statistical Mechanics” (PHYS 5705), fall semester 2003, 4 students, overall rating: 4.0.

- Undergraduate “Foundations of Nuclear and Particle Physics” (PHYS 3504), spring semester 2004, 28 students, overall rating by 22 responders: 3.7.
- Undergraduate “Introduction to Quantum Mechanics I” (PHYS 4455), fall semester 2004, 17 students, overall rating by 13 responders: 3.8.
- Undergraduate “Introduction to Quantum Mechanics II” (PHYS 4456), spring semester 2005, 16 students, overall rating by 13 responders: 3.8.
- Undergraduate “Introduction to Quantum Mechanics II” (PHYS 4456), spring semester 2006, 17 students, overall rating by 16 responders: 3.1.
- Graduate “Special Study: Superconductivity” (PHYS 5984), spring semester 2006, 3 students, overall rating: 4.0.
- Undergraduate “Introduction to Quantum Mechanics II” (PHYS 4456), spring semester 2007, 13 students, overall rating by 3 responders: 3.7.
- Graduate “Quantum Mechanics II” (PHYS 5456), spring semester 2007, 12 students, overall rating by 9 responders: 3.8.
- Undergraduate “Introduction to Quantum Mechanics II” (PHYS 4456), spring semester 2008, 13 students, overall rating by 10 responders: 3.4.
- Graduate “Quantum Mechanics II” (PHYS 5456), spring semester 2008, 20 students, overall rating by 11 responders: 3.8.
- Graduate “Quantum Mechanics I” (PHYS 5455), fall semester 2008, 15 students, overall rating by 12 responders: 3.8.
- Graduate “Quantum Mechanics II” (PHYS 5456), spring semester 2009, 15 students, overall rating by 11 responders: 3.8.
- Graduate “Quantum Mechanics I” (PHYS 5455), fall semester 2009, 14 students, overall rating by 10 responders: 3.8.
- Graduate “Quantum Mechanics II” (PHYS 5456), spring semester 2010. 14 students, overall rating by 11 responders: 3.6.
- Graduate “Quantum Mechanics I” (PHYS 5455), fall semester 2010, 18 students, overall rating by 17 responders: 3.8.
- Graduate “Quantum Mechanics II” (PHYS 5456), spring semester 2011, 17 students, overall rating by 11 responders: 3.9.

Students' evaluations rating scale beginning fall 2011: 1 – 6 (highest):

- Graduate “Advanced Solid State Physics II” (PHYS 6556), fall semester 2011, 4 students, overall rating: 6.00.
- Undergraduate “Introduction to Quantum Mechanics I” (PHYS 4455), spring semester 2012, 21 students, overall rating by 18 responders: 5.50.
- Graduate “Statistical Mechanics” (PHYS 5705), spring semester 2013, 16 students, overall rating by 10 responders: 5.30.
- Undergraduate “Highlights of Contemporary Physics” (PHYS 2074, team-taught), “Relativity” module, fall semester 2013, 92 students; overall rating by 32 responders (for all course modules): 5.34.
- Graduate “Advanced Solid State Physics I” (PHYS 6555), fall semester 2013, 7 students, overall rating by 4 responders: 5.25.
- Graduate “Advanced Solid State Physics II” (PHYS 6556), spring semester 2014, 5 students, overall rating by 2 responders: 6.00.
- Undergraduate “Highlights of Contemporary Physics” (PHYS 2074, team-taught), “Relativity” module, fall semester 2014, 108 students (no rating).
- Graduate “(Non-Equilibrium) Statistical Mechanics 2” (PHYS 5706), fall semester 2014, 9 students, overall rating by 8 responders: 5.88.
- Conjoint undergraduate / graduate “(Introduction to) Biophysics” (PHYS 4714 / 5714G), spring semester 2015, 14 / 4 students, overall rating by 6 / 3 responders: 5.33 / 5.67.
- Undergraduate “Highlights of Contemporary Physics” (PHYS 2074, team-taught), “Relativity” module, fall semester 2015, 66 students (no rating).
- Graduate “Quantum Mechanics II” (PHYS 5456), fall semester 2015, 12 students, overall rating by 5 responders: 5.80.
- Undergraduate “Thermal Physics” (PHYS 3704), spring semester 2016, 42 students, overall rating by 15 responders: 5.40.
- Undergraduate “Highlights of Contemporary Physics” (PHYS 2074, team-taught), “Relativity” module, fall semester 2016, 80 students (no rating).
- Graduate “(Non-Equilibrium) Statistical Mechanics 2” (PHYS 5706), fall semester 2016, 5 students, overall rating by 5 responders: 5.60.

- Undergraduate “Thermal Physics” (PHYS 3704), spring semester 2017, 57 students, overall rating by 28 responders: 5.11.
- Conjoint undergraduate / graduate “(Introduction to) Biophysics” (PHYS 4714 / 5714G), fall semester 2017, 16 / 7 students, overall rating by 7 / 4 responders: 5.43 / 5.50.
- Graduate “Statistical Mechanics” (PHYS 5705), spring semester 2018, 16 students, overall rating by 13 responders: 5.69.
- Undergraduate “Highlights of Contemporary Physics” (PHYS 2074, team-taught), “Relativity” module, fall semester 2018, 95 students, overall rating for this module by 46 responders: 5.15.
- Conjoint undergraduate / graduate “(Introduction to) Biophysics” (PHYS 4714 / 5714G), fall semester 2018, 18 / 1 students, overall rating by 10 / 1 responders: 5.10 / 6.00.
- Graduate “Statistical Mechanics” (PHYS 5705), spring semester 2019, 16 students, overall rating by 13 responders: 5.77.
- Graduate “Statistical Mechanics 2 – Critical Dynamics” (PHYS 5706), spring semester 2019, 3 students, overall rating by 2 responders: 6.00.
- Graduate “Statistical Mechanics” (PHYS 5705), spring semester 2020 (second half online), 15 students, overall rating by 7 responders: 5.86.
- Graduate “(Non-Equilibrium) Statistical Mechanics 2” (PHYS 5706), fall semester 2020 (online), 5 students, overall rating by 5 responders: 5.75.
- Graduate “Statistical Mechanics” (PHYS 5705), spring semester 2021 (online), 21 students, overall rating by 7 responders: 5.71.
- Graduate “(Non-Equilibrium) Statistical Mechanics 2” (PHYS 5706), fall semester 2021, 9 students, overall rating by 8 responders: 5.63.
- Undergraduate “Introduction to Quantum Mechanics I” (PHYS 4455), spring semester 2022, 40 students, overall rating by 21 responders: 2.62.
- Undergraduate “Introduction to Quantum Mechanics II” (PHYS 4456), fall semester 2022, 33 students, overall rating by 14 responders: 3.21.
- Graduate “Statistical Mechanics” (PHYS 5705), spring semester 2023, 31 students, overall rating by 27 responders: 5.27.
- Graduate “(Non-Equilibrium) Statistical Mechanics 2” (PHYS 5706), fall semester 2023, 5 students, overall rating by 1 responder: 5.00.

- Graduate “Statistical Mechanics” (PHYS 5705), spring semester 2024, 20 students.
- Graduate “Advanced Solid State Physics I” (PHYS 6555), fall semester 2024.

Graduate Course at Oxford University

- “Dynamic Critical Phenomena”, Michaelmas term 1996.

Advanced Level Student Seminars at TU München

- “Functional Integrals in Many-Particle Physics and Relativistic Field Theory”, winter semester 1992/93.
- “Selected Topics in Advanced Statistical Physics”, summer semester 1992.
- “Many-Particle Physics”, winter semester 1988/89.

Problem Classes in Theoretical Physics at TU München

- “Renormalization Group Theory of Critical Phenomena”, summer semester 1991.
- “Advanced Quantum Mechanics”, winter semester 1990/91.
- “Statistical Physics and Thermodynamics”, summer semesters 1987, 1989, 1990.
- “Quantum Mechanics”, winter semester 1989/90.

Advising

- Faculty advisor for Virginia Tech Society of Physics Students (SPS) chapter, fall 2004 – spring 2005.
- As member of the Physics Department’s Graduate Committee, I served as temporary faculty advisor for incoming graduate students, fall 2006 – spring 2014.

Teaching and Outreach

- I initiated contacts between Tall Oaks Montessori (Elementary) School and the Virginia Tech Physics Outreach Program, and arranged physics demonstrations (spring 2001 and fall 2002) by our undergraduate students, under the guidance of our outreach program coordinators Amy Emerson and Alma Robinson.
- During several visits to the Upper Elementary Class of Tall Oaks Montessori School at Blacksburg, VA, fall 2001 – spring 2003, fall 2007 and 2009, I talked with the students there about large numbers, introduced powers of ten, and explained how to arrive at physical estimates; we discussed present-day astrophysics and cosmology; and I demonstrated the mathematical and logical approach to problem solving.
- I visited Computer Technology classes at Blacksburg Middle School, sixth and seventh grade (fall 2003, spring 2005, and fall 2011), and explained to the students how computers, the internet, and modern information technology in general are incorporated into university research and teaching. I also demonstrated the use of computer simulations in my own group's research.
- In 2003, I participated in an interview series, conducted by Rebecca Reiff (Hollins University, Roanoke, VA) on my personal view of the scientific process and its representation in high school and college science textbooks.
- WVTF radio coverage “Large Covid Outbreaks ‘Very Likely’ On College Campuses, Unless...”, Oct. 26, 2020: www.wvtf.org/post/large-covid-outbreaks-very-likely-college-campuses-unless#stream/0; shortened version broadcast on NPR, Oct. 31, 2020.

Diploma Students at TU München

Official supervisor Prof. Dr. F. Schwabl, I guided the students' research.

- Christian Baumgärtel, *Dipl.-Phys.*, TU München 1993
- Michael Bulenda, *Dipl.-Phys.*, TU München 1993
- Reinhard Eckl, *Dipl.-Phys.*, TU München 1991

Graduate Students at TU München

Official supervisor Prof. Dr. F. Schwabl, I guided the students' research.

- Bernhard A. Kaufmann, *Dr. rer. nat.*, TU München 1999
- Michael Bulenda, *Dr. rer. nat.*, TU München 1999

Graduate Student at Oxford

- Jaime E. Santos, Ph.D. student, University of Oxford, Ph.D. 1997, deceased July 2023.

I was Jaime Santos' co-advisor (jointly with Dr. G. Schütz), while his regular advisor Dr. R. Stinchcombe was absent.

International Exchange Students at Virginia Tech

- Shengfeng Deng, visiting Ph.D. student, Sep. 2018 – Sep. 2020, from Central China Normal University, Wuhan, P.R. China, sponsored by the China Scholarship Council. I served as co-advisor on Shengfeng's Ph.D. committee, November 2020; dissertation: *Phase transitions in unitary and binary stochastic contact processes*; assistant professor, Shaanxi Normal University, Xi'an, P.R. China.
- Patchawat Songjaroensap, IAESTE intern, fall 2011, from Thammasat University Bangkok, Thailand.
- Ulrich Dobramysl, IAESTE intern, fall 2006, from Johannes-Kepler University Linz, Austria. In 2009, Uli joined our graduate Ph.D. program.

Undergraduate Honors Thesis at Virginia Tech

- Beth A. Reid, *B.S. Senior Honors Thesis*, Virginia Tech 2003

For her undergraduate research under my supervision, Beth received the American Society of Physics Students' *Outstanding Student Award for Undergraduate Research*. She was also a finalist for the American Physical Society's *LeRoy Apker Award for Undergraduate Physics Achievement*.

Undergraduate Research Students at Virginia Tech

- Julianna “Jules” Kelley, since 2023 – spring 2024.
- Xander Fry, summer 2023.
- Teddy Clough, spring 2023.
- Canon Zeidan, fall 2022 – spring 2024.
- Brian Thibodeau, spring 2022.
- Marco Brizzolara, spring 2022.
- Nash Gatenby-Latham, summer – fall 2021.
- Mira Eisenhauer, summer 2021.
- Michael “Misha” N. Ryjik, spring 2019.
- M. Lazarus Arnau, summer 2018 – spring 2019, spring 2020.
- Harrison Andrew, New College of Florida, summer 2018.
- Ethan N. Parkhill, spring 2018.
- Kenneth R. Mc Larney, spring 2018.
- Alexandra J. Bosh, fall 2017 – spring 2018.
- Austin “Ada” B. Warren, spring 2017 – summer 2018.
- Nicholas V. Wilson, fall 2016 – spring 2018.
- John “Jack” L. Monk, fall 2016 – spring 2017, fall 2017 – spring 2018.
- Bassel M. Heiba, fall 2016 – spring 2017.
- Nathan W. Galliher, summer 2016 – spring 2018.
- Maximilian D. Shafer, summer 2016 – fall 2017.
- Yizhou Wang, summer 2016.
- Nathan T. Rogers, fall 2015 – spring 2016.
- Peter F. Morrissey, summer 2015 – summer 2016.
- Patrick C. Lewis, summer and fall 2012.

- Jackson G. Walters, summer 2012.
- John H. “Will” Frey, spring 2011.
- Gabriel Martinez, spring 2010.
- Ben F.M. Intoy, spring 2010.
- Samir F. Abboud, spring 2007.
- Sean E. Cutchin, fall 2004 – spring 2005.
- Stuart M. Bergeron, fall 2004 – spring 2005.
- Greg I. Knight, fall 2004 – spring 2005.
- George L. Daquila, summer 2004 – summer 2006.
- Geoffrey K. Adams, spring – fall 2004, spring 2007.
- Eric C. Spiegel, fall 2003 – summer 2004.
- Mark J. Washenberger, fall 2002 – fall 2004, spring 2006.
- Brian J. Donovan, summer 2002 – spring 2005.
- Matthew L. Joyce, summer 2002 – spring 2003.
- Jason C. Brunson, spring – fall 2002.
- Beth A. Reid, fall 2001 – summer 2003.
- Brad F. Habenicht, spring 2002.
- James H. Roberts, spring 2001.
- Seth A. Smith, fall 2000 – spring 2001.

Graduate Students at Virginia Tech

- Sara Shabani, Ph.D. student (since spring 2023).
- Kenneth A.V. Distefano, Ph.D. student (since spring 2022).
- Mohamed Swailem, Ph.D. April 2024,
dissertation: *Aspects of population dynamics*.

- Hong Yao, Ph.D. May 2023,
dissertation: *Some aspects of fluctuation driven phenomena*;
actuarial predictive modelling analyst, Cincinnati Insurance Company,
Cincinnati, OH.
- Behnaz Khaghani, graduate student (fall 2022 – spring 2023).
- Brian Bennett, M.S. December 2022.
- Liev Birman, graduate student (fall 2021 – spring 2022).
- Riya Nandi, Ph.D. March 2021,
dissertation: *Critical dynamics in Heisenberg antiferromagnets and
molecular motor-inspired exclusion processes*;
postdoctoral research associate, University of Geneva, Switzerland.
- Ruslan I. Mukhamadiarov, Ph.D. February 2021,
dissertation: *Controlling non-equilibrium dynamics in lattice gas mod-
els*;
postdoctoral research associate, Ludwig Maximilians University Mu-
nich, Germany.
- Shannon R. Serrao, Ph.D. December 2020,
dissertation: *Stochastic effects on extinction and pattern formation in
the three-species cyclic May–Leonard model*.
- Chinmay Katke, graduate student (spring – fall 2020).
- Christy Pius, graduate student (spring – summer 2020).
- Weigang Liu, Ph.D. May 2019,
dissertation: *A general study of the complex Ginzburg–Landau equation*;
software development engineer, Amazon, Seattle, WA.
- Jacob A. Carroll, Ph.D. February 2019,
dissertation: *Examining the dynamics of biologically inspired systems
far from equilibrium*;
senior software engineer, Lockheed Martin, Littleton, CO.
- Harshwardhan N. Chaturvedi, Ph.D. November 2018,
dissertation: *Dynamics of driven vortices in disordered type-II super-
conductors*;
data scientist, Microsoft, Atlanta, GA.
- Sheng Chen, Ph.D. November 2017,
dissertation: *Population dynamics of stochastic lattice Lotka–Volterra
models*;
software engineer, Facebook, New York, NY.

- Hiba Assi, Ph.D. February 2016,
dissertation: *Non-equilibrium relaxation dynamics in disordered superconductors and semiconductors*;
lecturer of physics, Kettering University, Fenton, MI.
- Ulrich Dobramysl, Ph.D. August 2013,
dissertation: *On the relaxation dynamics of disordered systems*;
postdoctoral research associate, University of Oxford, U.K.
- Qian He, Ph.D. November 2011,
dissertation: *Spatio-temporal patterns, correlations, and disorder in evolutionary game theory*;
vice president, Bank of America Merrill Lynch, New York, NY.
- Matthew T. Shimer, Ph.D. August 2011,
dissertation: *Nonequilibrium relaxation and aging scaling properties of the Coulomb glass and Bose glass*;
director of quantitative analysis, hMetrix LLC, Bala Cynwyd, PA.
- George L. Daquila, Ph.D. August 2011,
dissertation: *Monte Carlo analysis of nonequilibrium steady states and relaxation kinetics in driven lattice gases*;
engineering manager, Google, New York, NY.
- Swapnil Jawkar, M.S. May 2011;
assistant professor, SIES College of Arts, Science and Commerce,
Mumbai, India; deceased April 2021.
- Thananart Klongcheongsan, Ph.D. May 2009,
dissertation: *Driven magnetic flux lines in type-II superconductors: nonequilibrium steady states and relaxation properties*;
Royal Thai Army intelligence officer, Thailand.
- Matthew T. Raum, M.S. May 2007;
Baker Hughes Inc., Blacksburg, VA.
- Fiona Persaud, graduate student (summer – fall 2005).
- Thomas J. Bullard, Ph.D. May 2005,
dissertation: *A study of narrowband noise characteristics associated with vortex motion in high-temperature superconductors*;
staff physicist, UES Inc., Dayton, OH.
- Satheesh Angaiah, Ph.D. student in Electrical Engineering,
Virginia Tech, research assistant 2004.

- Vamsi K. Akkineni, M.S. June 2001,
obtained Ph.D. at the University of Illinois at Urbana-Champaign;
quantitative analyst, sustainable energy R & D, Google Inc., CA.

Postdoctoral Associates at Virginia Tech

- Dr. Reda Tiani, January 2022 – April 2023;
funded through a Belgian American Educational Foundation (B.A.E.F.)
grant and a postdoc fellowship from the Free University of Brussels,
Belgium.
- Dr. Priyanka, January 2018 – December 2020;
funded through U.S. Army Research Grant (with Michel Pleimling);
Postdoctoral Associate, University of Illinois Urbana-Champaign, IL.
- Dr. Gunnar Prüßner, summer 2004 – fall 2005;
Senior Lecturer in Mathematical Physics, Department of Mathematics,
Imperial College, London, U.K.
- Dr. Mauro Mobilia, spring 2004 – summer 2005;
Associate Professor, Department of Applied Mathematics,
University of Leeds, U.K.
- Dr. Ivan T. Georgiev, summer 2003 – fall 2005;
Executive Director, Commodities & Energy Markets, JPMorgan,
London, U.K.
- Dr. Manoj Gopalakrishnan, fall 2001 – spring 2004;
Assistant Professor, Department of Physics,
Indian Institute of Technology (IIT) Madras, India.
- Dr. Olivier Deloubrière, fall 2001 – summer 2003;
Business Intelligence Consultant, Paris, France.
- Dr. Jayajit Das, fall 2000 – spring 2002;
Professor, Battelle Center for Mathematical Medicine,
Nationwide Children's Hospital, Columbus, OH.
- Dr. Jérôme Magnin, fall 2000 – summer 2001;
Head of Statistics & Central Registers,
Centrale de Compensation AVS/AI, Geneva, Switzerland.
- Dr. Timo Aspelmeier, fall 2000 – fall 2001;
Senior Researcher, Institut für Theoretische Physik,
Georg-August-Universität Göttingen, Germany, deceased April 2023.
- Dr. Martin J. Howard, spring 1999 – fall 2000;
Professor, Department of Systems Biology, John Innes Centre,
Norwich, U.K.

Until 2005, postdoctoral associates were in part funded jointly through my
colleagues' Beate Schmittmann and Royce Zia's and my research grants.

Professional Service

Conference Organization

- Co-organizer, with B. Schmittmann (Virginia Tech; main organizer), P.A. Rikvold (Florida State University), and B. Chakraborty (Brandeis University) of International Symposium “Biological systems and soft materials: Future directions in statistical physics — A symposium on the interface of statistical physics, biology, and chemistry”, Department of Physics, Virginia Tech, Blacksburg, VA, March 6–7, 2004.
- Co-organizer, with R. Folk (Johannes-Kepler University Linz, Austria), of Symposium “Renormalization and Scaling”, German Physical Society (DPG) Spring Meeting, Berlin (Germany), March 5, 2005.
- Co-organizer, with B. Schmittmann (Virginia Tech), of Focus Session “Transport and Kinetics in Biological Systems”, American Physical Society (APS) March Meeting, Los Angeles, CA, March 24, 2005.
- Co-organizer, with M. Pleimling and B. Schmittmann (Virginia Tech), of Focus Session “Models and Materials far from Equilibrium”, American Physical Society (APS) March Meeting, New Orleans, LO, March 12, 2008.
- Co-organizer, with H. Marand, K. Park, M. Pleimling, and B. Schmittmann (Virginia Tech), of Symposium “Complexity in Materials far from Equilibrium”, Department of Physics, Virginia Tech, Blacksburg, Virginia, May 14–16, 2008.
- Co-organizer, with R. Kulkarni (Virginia Tech), of Focus Session “Stochastic Processes in Biological Systems”, American Physical Society (APS) March Meeting, Pittsburgh, PA, March 18, 2009.
- Co-organizer, with M. Pleimling, B. Schmittmann (Virginia Tech), and Ching-Hwa Kiang (Rice University), of the 2009 Boulder School for Condensed Matter and Materials Physics “Nonequilibrium Statistical Mechanics: Fundamental Problems and Applications”, July 6–24, 2009.
- Co-organizer, with M. Pleimling (Virginia Tech), of Focus Sessions “Stochastic Population Dynamics”, American Physical Society (APS) March Meeting, Boston, MA, February 28 & 29, 2012.
- Co-organizer, with M. Pleimling (Virginia Tech), of Focus Sessions “Population and Evolutionary Dynamics”, American Physical Society (APS) March Meeting, Baltimore, MD, March 18, 2013.

- Organizer of Invited Symposium “Nonequilibrium Relaxation and Aging in Materials”, American Physical Society (APS) March Meeting, Baltimore, MD, March 20, 2013.
- Co-organizer, with M. Pleimling (Virginia Tech), of Focus Sessions “Strong Correlations in Systems Far From Equilibrium”, American Physical Society (APS) March Meeting, Denver, CO, March 3 & 4, 2014.
- Advisory Committee Member, Sigma Phi International Conference on Statistical Physics 2014.
- Co-organizer, with Shengfeng Cheng, James Hanna, Sunghwan Jung (both Department of Biomedical Engineering and Mechanics), and Michel Pleimling, of the “Virginia Soft Matter Workshop”, Blacksburg, VA, October 4, 2014.
- Co-organizer, with M. Pleimling (Virginia Tech), of Focus Session “Fluctuations and Correlations far from Equilibrium”, American Physical Society (APS) March Meeting, San Antonio, TX, March 3 & 4, 2015.
- Co-organizer, with M. Pleimling (Virginia Tech), of Focus Session “Physics of Evolutionary and Population Dynamics”, American Physical Society (APS) March Meeting, San Antonio, TX, March 5, 2015.
- Organized invited ‘e-session’ on “Critical Dynamics” for Complex Systems Digital Campus (CS-DC)’15 World e-conference, October 1, 2015.
- Co-organizer, with M. Pleimling (Virginia Tech), of Focus Session “Population and Evolutionary Dynamics”, American Physical Society (APS) March Meeting, Baltimore, MD, March 15, 2016.
- Co-organizer, with M. Pleimling (Virginia Tech), of Focus Session “Non-equilibrium Systems with Large Fluctuations and Strong Correlations”, American Physical Society (APS) March Meeting, Baltimore, MD, March 17, 2016.
- Co-organizer, with S. Jung and V. Nguyen (Virginia Tech), of Center for Soft Matter and Biological Physics Symposium, Blacksburg, VA, May 19, 2016.
- Co-organizer, with M. Pleimling (Virginia Tech), of Focus Session “Noise and Stochastic Fluctuations in Biological Systems”, American Physical Society (APS) March Meeting, New Orleans, LO, March 2017.

- Co-organizer, with S. Cheng, J. Hanna, and M. Pleimling (Virginia Tech), of 5th Virginia Soft Matter Workshop, Virginia Tech, Blacksburg, VA, September 2018.
- * Co-organizer, with M. Pleimling (Virginia Tech), of Focus Session “Control of Noisy Non-linear Dynamical Systems”, American Physical Society (APS) March Meeting, Denver, CO, March 2020; conference canceled due to the COVID-19 pandemic; Focus Session rescheduled for the online American Physical Society March Meeting, March 2021.
- Organizer of Mini-Symposium “Statistical Physics Tools Applied to Stochastic Models in Population Dynamics and Epidemic Spreading”, 15th Conference on Dynamical Systems Applied to Biology and Natural Sciences (DSABNS), February 2024.

Professional Societies Membership and Service

- American Physical Society (APS);
 - I served as elected *Member-at-large* in the Executive Committee of the APS Topical Group on Statistical and Nonlinear Physics (GSPN), March 2015 – March 2018.
 - Chair of the APS Fellowship Selection Committee of the Topical Group on Statistical and Nonlinear Physics (GSPN), 2015.
 - Member of the APS Fellowship Selection Committee of the Topical Group on Statistical and Nonlinear Physics (GSPN), 2016, 2024.
 - Member of the Nominating Committee of the Topical Group on Statistical and Nonlinear Physics (GSPN), 2016.
 - Member of the APS *Lars Onsager Prize Selection Committee*, 2018.
 - Member of the APS *Leo P. Kadanoff Prize Selection Committee*, 2022.
 - Alternate member of the APS *Lars Onsager Prize Selection Committee*, 2014 and 2015.
- European Physical Society (EPS).
- Institute of Physics (IOP, U.K.).
- *Deutsche Physikalische Gesellschaft* (German Physical Society, DPG).
- Sigma Xi Scientific Research Society.

- American Association of University Professors (AAUP);
 - I served as elected Vice President in the Executive Committee of the AAUP Virginia Tech Chapter, October 2014 – September 2017; I have assumed this position again in May 2020.
- *Deutscher Hochschulverband* (German University Faculty Society, DHV).

Journal Editorial and Advisory Boards

- Lead Editor, The Physical Review E, since January 2021.
- Editorial Board: The Physical Review E, January 2017 – December 2020.
- Editorial Board: Journal of Physics A: Mathematical and Theoretical, June 2019 – December 2020.
- Advisory Panel: Journal of Physics A: Mathematical and Theoretical, December 2007 – May 2019.
- Guest Editor, with Pasquale Calabrese (SISSA Trieste, Italy) and Paul Fendley (University of Oxford, U.K.), of a Special issue of the Journal of Physics A: Mathematical and Theoretical dedicated to John Cardy for his 70th birthday, October 2016 – February 2018.
- Editorial Board: Symmetry, November 2019 – December 2020.
- Editorial Board, as Review Editor: Frontiers, August – December 2020.
- Editorial Board: Physics Research International (founded as Research Letters in Physics), September 2007 – June 2017.

Journal Referee

I was selected for the inaugural group of 534 *Outstanding Referees* (out of then 42,000) by the American Physical Society Journals, January 2008.

Regularly:

- Physical Review Letters
- The Physical Review B
- The Physical Review E
- The Physical Review X
- EPL (Europhysics Letters)
- The European Physical Journal B
- Journal of Physics A: Mathematical and Theoretical
- Journal of Statistical Physics
- Journal of Statistical Mechanics: Theory and Experiment (JSTAT)
- Physica A
- American Journal of Physics
- Mathematical Reviews

Occasionally:

- Nature Communications
- Proceedings of the National Academy of Sciences (PNAS)
- PloS ONE
- Advances in Physics
- The Physical Review A
- The European Physical Journal E
- New Journal of Physics
- Journal of Chemical Physics

- Journal of Mathematical Physics
- Bulletin of Mathematical Biology
- Biophysical Journal
- Physical Biology
- Journal of the Royal Society Interface
- Journal of Physics: Condensed Matter
- Journal of Physics: Conference Series
- Superconductor Science and Technology
- Nuclear Physics B
- Physics Letters A
- International Journal of Modern Physics B
- Condensed Matter Physics
- Polymers
- Chaos
- Symmetry
- Frontiers
- Acta Applicanda Mathematicae
- Computational and Applied Mathematics
- Communications in Nonlinear Science and Numerical Simulations
- Communications in Computational Physics
- SIAM Journal on Applied Dynamical Systems (SIADS)
- Applied Mathematical Modelling
- International Journal of Nonlinear Sciences and Numerical Simulation
- Advances in Difference Equations
- Journal of Polymer Engineering

- Energy Reports
- Ecology
- Journal of Ecology and the Natural Environment
- Mathematical Biosciences
- Journal of the Franklin Institute
- Scientific Reports
- Springer Plus
- Springer Proceedings in Mathematics and Statistics
- European Journal of Physics
- Mathematics Magazine
- TWMS Journal of Applied Engineering and Mathematics (JAEM)
- Journal for General Philosophy of Science

Book Proposal Review

- Cambridge University Press
- Oxford University Press
- Princeton University Press
- Institute of Physics Publishing
- Springer Nature
- CRC Press

Grant Proposal Review for Funding Agencies

Regularly:

- U.S. National Science Foundation, Division of Materials Research (NSF-DMR)
- U.S. Department of Energy, Basic Energy Sciences (DOE-BES)
- U.S. Army Research Office (ARO)
- Research Corporation for Science Advancement (RCSA)
- U.S.–Israel Binational Science Foundation (BSF)
- German–Israeli Foundation for Scientific Research and Development (GIF)
- Israel Science Foundation (ISF)
- *Deutsche Forschungsgemeinschaft* (German Research Foundation, DFG)

Occasionally:

- American Chemical Society (ACS) Petroleum Research Fund
- U.S. Civilian Research and Development Foundation (CRDF)
- U.K. Engineering and Physical Sciences Research Council (EPSRC)
- *Fonds zur Förderung der wissenschaftlichen Forschung* (Austrian Science Fund, FWF)
- Dutch Foundation for Fundamental Research on Matter (FOM)
- Agence National de la Recherche (French National Research Agency, ANR)
- Hungarian National Research, Development and Innovation Office (NRDI)
- Natural Sciences and Engineering Research Council of Canada (NSERC)

University Service at Virginia Tech

Department of Physics:

- Executive Committee (elected), fall 2004 – spring 2005; fall 2006 – spring 2007; fall 2009 – spring 2011, summer 2014 – spring 2015, summer 2017 – spring 2019; summer 2020 – spring 2023, since summer 2024.
- Promotion and Tenure / Personnel Committee, summer 2008 – summer 2012; since summer 2013.
- Graduate Committee, spring 2000 – spring 2014 (except fall 2005, fall 2012); Committee Chair August 2006 – August 2011, and spring 2012.
- Faculty Search Committees:
 - Particle Theory, spring 2001;
 - Condensed Matter Theory and Experiment, fall 2003;
 - Chair, Condensed Matter Experiment and Theory, fall 2004 / spring 2005;
 - Chair, Condensed Matter Theory, summer 2005 – spring 2006;
 - Astrophysics, fall 2006 / spring 2007;
 - Condensed Matter Theory, fall 2008 / spring 2009;
 - Theoretical Polymer Physics, fall 2012 / spring 2013;
 - Cosmology, fall 2013 / spring 2014;
 - Chair, Soft Matter and Biological Physics, fall 2016 / spring 2017.
 - Chair, Theoretical / Computational Soft Matter and / or Biological Physics, fall 2018 / spring 2019.
- Undergraduate Committee, since fall 2022.
- Long-Range Planning Committee, fall 2001 – spring 2003.
- Strategic Planning Committee, fall 2016 – spring 2019.
- Colloquium Committee, spring 2013 – spring 2014.
- Theory, Condensed Matter, and Special Topics Seminar Committee, fall 1999 - spring 2005.
- Honorifics Committee, fall 2014 – fall 2016.

- Faculty mentor and / or promotion coach for colleagues Lara Anderson, Rana Ashkar, Edward Barnes, Shengfeng Cheng, James Gray, Patrick Huber, Giti Khodaparast, Rahul Kulkarni, Kyungwha Park, Michel Pleimling, Vito Scarola, Eric Sharpe, and Tatsu Takeuchi.

Center for Soft Matter and Biological Physics:

- Starting in May 2015, colleagues Shengfeng Cheng, Will Mather, Vinh Nguyen, Michel Pleimling and I began to initiate the establishment of a new departmental research Center for Soft Matter and Biological Physics that was chartered in February 2016.
- I was the Center's founding Director until August 2022.
- I currently serve on the Center's Steering Committee, since September 2022.

College of Science:

- Executive Cluster Hiring Committee, fall 2003 – spring 2004.
- Graduate Advising / Awards Selection Committee, spring 2005 – spring 2011.
- Honorifics Committee, fall 2014 – summer 2017.
- J. Mark Sowers Distinguished Lectures Committee, fall 2016 – fall 2017.
- Personnel Committee and Personnel Subcommittee, fall 2017 – spring 2020.
- Arlington Innovation Center: Health Research Evaluation Committee, fall 2021.

Graduate School:

- Graduate Honor System (GHS) Advisory Board and Judicial Panel member, since fall 2002.
- Graduate Honor System Chief Justice Nomination / Selection Committee, summer 2003 and summer 2009.
- Graduate Honor System Constitutional Revision Committee, spring 2008 – spring 2009.
- Graduate Honor System Case Facilitator, since December 2009.

- Participated in and led Graduate Teaching Assistant Ethics Training Sessions, fall semesters 2010, 2014, 2015, 2016, 2018, and 2021.
- Participated in Graduate Education Week Panel on Graduate Advising and Mentoring, spring 2017.

University:

- Search Committee: Senior Associate Vice President for University Relations, summer 2015.
- Data Analytics and Decision Science Destination Area Design Team, fall 2016.
- Faculty Senate Committee on Governance, spring and summer 2018.
- Virginia Tech COVID-19 Modeling / Simulation Group, spring 2020 – spring 2022.