Curriculum Vitae

Alkan Kabakçıoğlu
Department of Physics, College of Sciences
Koç University
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Education & Employment

Assistant Professor at Koç University, Department of Physics,
Istanbul, Turkey *Jan 2005-present.*

Postdoctoral fellow at the University of Padova, Department of Physics,
Padova, Italy *2002-2004.*

Design Scientist in InQuira.com,
Los Angeles, CA, *2000-2002*

Dr. G. Picard Postdoctoral fellow at the Weizmann Institute of Science, Physics of Complex Systems,
Rehovot, Israel, *1999-2000.*

Ph.D. in Physics, MIT, Cambridge, Massachusetts, *1993-1999.*
Thesis title: " Scaling Studies of Random-Field Tricriticality, Electronic Conduction Models, and Interface Delocalization"
Thesis supervisor: Prof. A. Nihat Berker

M.Sc. in Physics, Bilkent University, Ankara, Turkey, *1990-1993.*
Thesis title: "Phase Transitions in Anisotropic Tetrahedral Ising Lattice: a Model for SiGe"
Thesis supervisor : Prof. M. Cemal Yalabık

B.Sc. in Electrical Engineering, Bilkent University, Ankara, Turkey, *1986-1990.*
Thesis title: "A New Algorithm for Real-Time Monitoring of ECG Signals"
Thesis supervisor: Prof. Ergin Atalar

Teaching experience

- Instructor for the following courses at Koç University:

  Physics:
  General Physics I: Mechanics (PHYS 101, Reference text: Young & Freedman)
  General Physics II: Electromagnetism (PHYS 102, Reference text: Young & Freedman)
  General Physics III: Waves, acoustics, thermodynamics (PHYS 203, Reference text: Young & Freedman)
  Statistical Physics (PHYS 301, Reference text: Kittel & Kroemer)
  Solid State Physics (PHYS/ELEC 403, Reference text: Ashcroft & Mermin)
  Statistical Thermodynamics* (CHEM 460/MASE 560, Reference text: Allen & Tildesley)
  Quantum Statistical Mechanics* (PHYS 506, Reference text: Kardar)
  Classical Mechanics* (PHYS 501, Reference text: Goldstein)
  Physics of Everyday Life (SCIE 109, Reference text: Bloomfield, "How Things Work")
  Balance Sheet for Sustainable Energy (SCIE 111, Reference text: MacKay, "Sustainable Energy")
  Special Topics in Biological Physics* (PHYS 580, Reference text: Nelson, "Biological Physics")
  Special Topics in Applied Physics* (PHYS 512)

  Math:
  Finite Mathematics (MATH 101, Reference text: Barnet, Ziegler & Byleen)
  Applied Mathematics* (MATH 503, Reference text: Kreyszig)
  Numerical Methods* (MATH 506, Reference text: Burden & Faires)

  *: graduate level

  Lecture notes and past exams for some of the courses can be found on the course webpages http://courses.ku.edu.tr/phys205|phys301|scie111.

- Academic advisor for one Ph.D. and three M.Sc. theses and co-advisor for three MSc theses:
  - Neşe Aral (M.Sc., Ph.D.) - starting as junior faculty at Türkisch-Deutsche Universität.
  - Batuhan Kav (M.Sc.) - Ph.D. student at MPI "Colloids and Interfaces", Postdam, Germany.
  - Murat Tuğrul (M.Sc.) - Ph.D. student at Institute of Science and Technology (IST), Austria.
  - Barış Avşaroğlu (M.Sc. co-advised) - Ph.D. student at Brandais University, USA.
  - Onur Varol (M.Sc. co-advised) - Ph.D. student at Indiana University, USA.
  - Murat Öztürk (M.Sc. co-advised) - Ph.D. student at Indiana University, USA.
- Instructor to the Turkish team for International Physics Olympiads.

Grants & Awards

- Outstanding Teaching Award, College of Sciences (2014-2015).
- PI for TUBITAK-1001 grant MFAG-114F348 "Dynamical behavior of twist storing biomolecules and their entanglement-induced scaling behavior" (2015-2018).
- PI for TUBITAK-1001 grant MFAG-113F092 "A novel method for identifying the functionally critical regions in allosteric proteins based on dynamical analysis of mode coupling" (2013-2016).
- PI for TUBITAK-1001 grant TBAG-110T618 "The effect of twist and writhe in the thermal melting behaviour of DNA" (2011-2013).
- PI for TUBITAK-1001 grant TBAG-106T553 "Analysis of the genetic regulatory network of yeast" (2007-2010).
- TUBITAK-2221 Visiting Scholar Support Grant. (2009).
- Habilitation (Doçent) title awarded by the Council of Higher Education of Turkey (2008).
- TUBITAK Summer School Support Grant. "International Advanced Research School on Biopolymers and Biophysics" (2008).
- TUBITAK-2221 Visiting Scholar Support Grant. (2008).

(TUBITAK: The Scientific and Technological Research Council of Turkey)

Publications

30. *Function changing mutations in glucocorticoid receptor evolution correlate with their significance to mode coupling*, B. Kav, M. Öztürk, and A. Kabakçıoğlu, arXiv:1509.05483.

29. *Coherent organization in gene regulation: a study on six networks*, N. Aral and A. Kabakçıoğlu, arXiv:1507.08062.

28. *Genome-wide target analysis of NeuroD2 reveals new insights into regulation of cortical projection neuron identity*, E. Bayam, G.S. Şahin, G. Güzelsoy, G. Güner, A. Kabakçıoğlu, G. İnce-Dunn, BMC Genetics, **16**, 681 (2015).

27. *Coherent regulation in yeast's cell-cycle network*, N. Aral and A. Kabakçıoğlu, Phys. Biol. **12**, 036002 (2015).

26. *Mode-coupling points to functionally important residues in Myosin II*, O. Varol, D. Yuret, B. Erman, A. Kabakçıoğlu, Proteins: Structure, Function, and Bioinformatics **82** (9), 1777 (2014).

25. *Denaturation of circular DNA: supercoils and overtwist*, A. Bar, A. Kabakçıoğlu, and D. Mukamel, Phys. Rev. E **86** (6), 061904 (2012).

24. *Deep spin-glass hysteresis-area collapse and scaling in the three-dimensional $\pm J$ Ising model*, O. Sarıyer, A. Kabakçıoğlu, and A.N. Berker, Phys. Rev. E **86** (4) (2012).

23. *Constrained thermal denaturation of DNA under fixed linking number*, A. Bar, A. Kabakçıoğlu, and D. Mukamel, Cent. Eur. J. Phys. **10** (3), 582 (2012).

22. *Macroscopic loop formation in circular DNA denaturation*, A. Kabakçıoğlu, A. Bar, and D. Mukamel, Phys. Rev. E **85** (5), 051919 (2012).

21. *Denaturation of circular DNA: Supercoil mechanism*, A. Bar, A. Kabakçıoğlu, and D. Mukamel, Phys. Rev. E **80** (1), 010903 (2011).

20. *Anharmonicity and mode-coupling in a fluctuating protein*, A. Kabakçıoğlu, M. Gür, D. Yuret, and B. Erman, Phys. Biol. **7**, 046005 (2010).

19. *Twist/writhe partitioning in a coarse-grained DNA minicircle model*, M. Sayar, B. Avşaroğlu, and A. Kabakçıoğlu, Phys. Rev. E **81**, 041916 (2010).

18. *Anomalies in the transcriptional regulatory network of the yeast Saccharomyces cerevisiae*, M. Tuğrul and A. Kabakçıoğlu, Journal of Theoretical Biology **263** (3), 328-336 (2010).

17. *Robustness of Transcriptional Regulation in Yeast-like Model Boolean Networks*, M. Tuğrul and A. Kabakçıoğlu, Int. J. Bifur. Chaos **20** (3), 929-935 (2010).

16. *Supercoil formation in DNA denaturation*, A. Kabakçıoğlu , E. Orlandini, and D. Mukamel, Phys. Rev. E Rapid Comm. **80** (1), 010903 (2009).

15. *Transcriptional regulatory network topology from statistics of DNA binding sites*, A. Kabakçıoğlu , Physica A **286**, 764-769 (2007).

14. *Percolation transition in a dynamically clustered network*, A. Zen, A. Kabakçıoğlu , and A.L. Stella, Phys. Rev. E **76**, 026110 (2007).

13. *The Information Coded in the Yeast Response Elements Accounts for Most of the Topological Properties of Its Transcriptional Regulation Network*, D. Balcan, A. Kabakçıoğlu, M. Mungan, and A. Erzan, PLoS ONE **2**(6): e501 (2007)

12. *A scale free network hidden in the collapsing polymer*, A. Kabakçıoğlu and A. L. Stella, Phys. Rev. E Rapid Comm. **72** (5), 055102 (2005).

11. *Analytical solution of a stochastic content-based network model*, M. Mungan, A. Kabakçıoğlu, D. Balcan, and A. Erzan, J. Phys. A: Math. Gen. **38** 9599 (2005).

10. *Pseudoknots in a Homopolymer*, A. Kabakçıoğlu and A. L. Stella, Phys. Rev. E **70**, 011802 (2004).
9. *Connection-Length Optimization in Scale-Free Networks*, S. S. Manna and A. Kabakçıoğlu, J. Phys. A: Math. Gen. **36**, L279-L285 (2003).
8. *Scaling Behavior of a Multiply Connected Fluctuating Interface in Two Dimensions*, H. Kaya, A. Kabakçıoğlu, and A. Erzan, Fractals **11** 227-232 (2003).
7. *Statistical Properties of Contact Vectors*, A. Kabakçıoğlu, M. Vendruscolo, I. Kanter, and E. Domany, Phys. Rev. E **65**, 41904 (2002).
6. *Hard-Spin Mean-Field Theory: A Systematic Derivation and Exact Correlations in One Dimension*, A. Kabakçıoğlu, Phys. Rev. E **61**, 3366 (2000).
5. *Delocalization Transition of a Rough Adsorption-Reaction Interface*, H. Kaya, A. Kabakçıoğlu, and A. Erzan, Phys. Rev. E **61**, 1102 (2000).
4. *Strongly Asymmetric Tricriticality of Quenched Random-Field Systems*, A. Kabakçıoğlu and A.N. Berker, Phys. Rev. Lett. **82**, 2572 (1999).
3. *Closed-Form Solutions and Free Energy of Hard-Spin Mean-Field Theory of a Fully Frustrated System*, A. Kabakçıoğlu, A.N. Berker, and M.C. Yalabık, Phys. Rev. E **49**, 2680 (1993).
2. *Phase Transitions in Anisotropic Tetrahedral Ising Lattice*, A. Kabakçıoğlu and M.C. Yalabık, Tr. J. of Physics **18**, 404 (1994).
1. *Hard-Spin Mean-Field Theory*, A.N. Berker, A. Kabakçıoğlu, R.R. Netz, and M.C. Yalabık, Tr. J. of Physics **18**, 354 (1994).

Professional Affiliations:

- Organizing commitee member for Statistical Physics Days (IFG), Turkey (2009-present).
- Scientific organizational board member for Institute of Theoretical and Applied Physics (ITAP, Turkey) (2006-present).
- Organizing committee member for National Physics Olympiads (2013-2014).
- Member of American Physical Society, Biophysical Society, and Turkish Physical Society.

Talks & Conferences

- Mimar Sinan University, Physics Dept., Istanbul (Mar 15, 2015).
- APS March Meeting, St Antonio TX, USA (Mar 02, 2015).
- 21st Statistical Physics Days, Erciyes University (June, 2014).
- Mirror Conference on Statistical and Condensed Matter Physics, Minerva Palas, Sabanci Univ., Istanbul (Dec 23, 2013).
- Invited conference presentation on "Physical Concepts of Nucleic-Acid Structure and Behavior", Yerevan, Armenia* (May, 2013).
- Biophysics Faculty Chalk Talk, MIT (May, 2013).
- 108th Statistical Mechanics Meeting, Rutgers University (16-18 Dec, 2012).
- Boğaziçi University, Physics Dept., Istanbul (Oct 24, 2012).
- APS March Meeting, Boston MA, USA (Feb 27, 2012).
- Middle East Technical Univ (ODTU), Ankara (Oct 26, 2011).
- Bilkent University, Dept. of Physics (Apr 13, 2011).

- Short talk, Mirror Conference of the Dallas Meeting of APS, 103. Statistical Physics Conference, Feza Gursey Inst., Istanbul (Dec 2010).
- Invited talk, 2nd Greek-Turkish Conference on Statistical Mechanics and Dynamical Systems (Sep 2010).
- Catholic University of Leuven, Belgium (Jun 2010).
- Padova University, Dept. of Physics (Apr 27, 2010).
- Sabanci University, Istanbul (Mar 2010).
- APS March Meeting, Portland OR, USA (Mar 16, 2010).
- MIT, Prof. Nihat Berker's 60th Birthday Celebration Symposium (17 Oct, 2009).
- Weizmann Institute of Science, Dept. of Physics of Complex Systems (25 May, 2009).
- Istanbul Technical University 16th Statistical Physics Days (June 2009).
- Boğaziçi University, Physics Dept, Istanbul (18 March 2009).
- 100th Statistical Mechanics Meeting, Rutgers University (14-18 Dec, 2008).
- Invited talk in the 1st Greek-Turkish Conference on Statistical Mechanics and Dynamical Systems, Rhodos-Marmaris (September 2008).
- Istanbul University, Kortel Seminar Series (27 Mar, 2008).
- Scuola Superiore di Catania (19 Dec, 2007).
- 98th Statistical Mechanics Meeting, Rutgers University (16 Dec 2007).
- Invited talk in the meeting Stochastic Networks and Internet Technology at Scuola Normale Superiore, Pisa (September 2007).
- Invited talk at the annual meeting of Turkish Physical Society (August 2007).
- PASI conference on disordered and complex systems (2006).
- Istanbul Technical University 13th Statistical Physics Days (2006).
- 94th Statistical Mechanics Meeting, Rutgers University (2005).
- Bogazici University, Department of Physics (Nov 30, 2005).
- Invited talk at 11th Istanbul Statistical Physics Days, Istanbul Technical University (2004).
- Invited talk in Bioinformatics Cluster-EURO/INFORMS 2003 Meeting, Koç Univesity (2003).
- Invited talk in Istanbul Technical University 6th Statistical Physics Days (1999).
- 80th Statistical Mechanics Meeting, Rutgers University (1998).
- 5th İstanbul Statistical Physics Days, İstanbul Technical University (1998).
- 79th Statistical Mechanics Meeting, Rutgers University (1998).
- APS March Meeting, Pittsburgh (1994).
- 1^{st} Istanbul Statistical Physics Days, Istanbul Technical University (1994).

* Could not attend due to bureaucratic difficulties.

Workshops & Schools

- SigmaPhi-2011, Workshop on Biophysics, Cyprus (July 11-15, 2011).
- Lecturer of the summer school on "Advanced Statistical Physics", IARS-Turunc-Marmaris, Turkey, (July 2009).

- Organizer of the "International Advanced Research School (IARS) on Biopolymers and Bioinformatics", Turunc-Marmaris, Turkey, (July 2008).
- Lecturer for the intense course on "Phase Transitions and Renormalization Group", Feza Gürsey Institute & Boğaziçi U. (July 2008).
- Participated International Workshop on "Knots and Macromolecules II", Venice, Italy (March 2008).
- Lecturer for the intense course on "Phase Transitions and Renormalization Group", Feza Gürsey Institute & Boğaziçi U. (July 2007).
- Lecturer and organizing commitee member of the "International Advanced Research School (IARS) on Statistical Mechanics and Complexity", Turunc-Marmaris, Turkey, (July 2007).
- Invited talk at the bilateral workshop on "Basics in Real-Space Theories" at Max Planck Institute, Dresden, (July, 2006).
- Oral presentation at PASI Workshop on Disorder and Complexity, Mar del Plata (2006).
- Oral presentation and the organizing commitee member of the "Workshop on New Directions in Complex Systems", Buyukada-Istanbul, Turkey, (September 2006).
- Invited lectures on "Monte-Carlo methods in polymer physics" at the National Workshop on Solid State Physics (YMFEC), Mugla Univ. (2005).
- Invited talk in CECAM Workshop on Statistical Mechanics of Random Copolymers, Lyon (2003).

Other academic activities and responsibilities

- KU Physics department representative (2012-2014).
- Organizer of the CS UNIV 101 popular science seminars (2012-2014).
- Editorial board member of KU Press (2014-).
- Academic advisory board member of the online KU publication KUrious (2014-).
- Referee for Physical Review Letters, Physical Review E, Europhysics Letters, European Physical Journal, Physica, Journal of Statistical Physics, Physical Biology, BMC and PLoS journals, as well as in TUBITAK project evaluation panels.
- Visited MIT Physics Department on leave-of-absence from KU (Spring 2013).