

Nikos Theodorakopoulos

List of publications

A. Articles in refereed journals

1. N. Theodorakopoulos
Effects of dimensionality upon transport coefficients near the liquid-gas critical point
Nuovo Cimento Letters **2**, 528 (1969)
2. N. Theodorakopoulos
Nearest neighbor Ising model with added local 4-spin interaction
Zeitschrift für Physik **254**, 399 (1972)
3. N. Theodorakopoulos
Phase transition of the compressible Ising lattice
Solid State Communications **12**, 955 (1973)
4. W. Hasenfratz, R. Klein and N. Theodorakopoulos
Light scattering from moving cluster walls in a model of displacive phase transitions
Solid State Communications **18**, 893 (1976)
5. N. Theodorakopoulos and J. Jäckle
Low frequency Raman scattering by defects in glasses
Physical Review B **14**, 2637 (1976)
6. N. Theodorakopoulos
Dynamics of non-linear systems: the kink-phonon interaction
Zeitschrift für Physik B **33**, 385 (1979)
7. N. Theodorakopoulos
On the statistical mechanics of the discrete ϕ^4 chain
Journal of Physics A **12**, L211 (1979)
8. N. Theodorakopoulos, W. Wunderlich and R. Klein
Lattice phonons in the presence of non-linear excitations
Solid State Communications **33**, 213 (1979)
9. R. Klein, W. Hasenfratz, N. Theodorakopoulos and W. Wunderlich
The kink-phonon and the kink-kink interaction in the ϕ^4 model
Ferroelectrics **26**, 721-724 (1980)
10. N. Theodorakopoulos and R. Klein
Phonon fluctuations and soliton diffusion in nonlinear Hamiltonian systems
Physica Status Solidi (a) **61**, 107 (1980)

11. N. Theodorakopoulos
Thermodynamics of a Sine-Gordon breather gas
Zeitschrift für Physik B **46**, 367 (1982)
12. N. Theodorakopoulos and F. G. Mertens
Dynamics of the Toda lattice: a soliton-phonon phase shift analysis
Physical Review B **28**, 3512 (1983)
13. N. Theodorakopoulos
Finite temperature excitations of the classical Toda chain
Physical Review Letters **53**, 871 (1984)
14. N. Theodorakopoulos
Ideal-gas approach to the statistical mechanics of integrable systems
Physical Review B **30**, 4071 (1984) - RC
15. P. Perez and N. Theodorakopoulos
Solitary excitations in the α -helix: viscous and thermal effects
Physics Letters A **117**, 405 (1986)
16. P. Perez and N. Theodorakopoulos
Competing mechanisms for the transport of energy in the α -helix
Physics Letters A **124**, 267 (1987)
17. N. Theodorakopoulos and E. W. Weller
Fluctuation properties of thermal solitons
Physical Review B **37**, 6200 (1988)
18. N. Theodorakopoulos and E. W. Weller
Low-temperature dynamics of Sine-Gordon solitons
Physical Review B **38**, 2749 (1988)
19. N. Theodorakopoulos
Semiclassical excitation spectrum of an integrable discrete spin chain
Physics Letters A **130**, 249 (1988)
20. N. Theodorakopoulos and N. C. Bacalis
Semiclassical solitons and the S=1/2 Heisenberg model
Physical Review Letters **67**, 3018 (1991)
21. N. Theodorakopoulos and N. C. Bacalis
Thermal solitons in the Toda chain
Physical Review B **46**, 10706 (1992)
22. N. Theodorakopoulos
Non-topological thermal solitons in isotropic ferromagnetic lattices
Physical Review B **52**, 9507 (1995); arXiv:cond-mat/9506061
23. V. Constantoudis and N. Theodorakopoulos
Quantum signatures of chaos in integrable systems
Journal of Physics A **28**, 5701 (1995)

24. P.B. Farmer, O. Sepai, R. Lawrence, H. Autrup, P. Sabro Nielsen, A.B. Vestergard, R. Waters, C. Leuratti, N.J. Jones, J. Stone, R.A. Baan, J.H. van Delft, M.J. Steenwinkel, S.A. Kyrtopoulos, V.I. Souliotis, N. Theodorakopoulos, N.C. Bacalis, A.T. Natarajan, A.D. Bates, A. Haugen, Å. Andreassen, S. Øvrebø, D.E. Shuker, K.S. Amaning, P. Castelain
Biomonitoring human exposure to environmental carcinogenic chemicals
Mutagenesis **11**, 363 (1996)
25. N. Theodorakopoulos, N.C. Bacalis and Z. Xiong
Thermodynamics of the Ishimori-Haldane-Faddeev ferromagnetic chain: the field-dependent case
Physical Review B **54**, 4033 (1996)
26. N. Theodorakopoulos and N.C. Bacalis
Low temperature asymptotics of isotropic ferromagnetic chains at non-zero fields
Physical Review B **55**, 52 (1997)
27. N.C. Bacalis, N. Theodorakopoulos and D.A. Papaconstantopoulos
Wavevector-dependent Stoner approach to band ferromagnetism in Ni
Physical Review B **55**, 11391 (1997)
28. V. Constantoudis and N. Theodorakopoulos
Nonlinear dynamics of classical Heisenberg chains
Physical Review E **55**, 7612 (1997)
29. V. Constantoudis and N. Theodorakopoulos
Lyapunov exponent, stretching numbers and islands of stability of the kicked top
Physical Review E **56**, 5189 (1997)
30. N. Theodorakopoulos and M. Peyrard
Solitons and non-dissipative diffusion
Physical Review Letters **83**, 2293 (1999)
31. N. Theodorakopoulos, T. Dauxois and M. Peyrard
Order of the phase transition in models of DNA thermal denaturation
Physical Review Letters **85**, 6 (2000); arXiv:cond-mat/0004487
32. T. Dauxois, N. Theodorakopoulos and M. Peyrard
Thermodynamic instabilities in one dimension: correlations, scaling and solitons
Journal of Statistical Physics **107**, 869 (2002); arXiv:cond-mat/0105341
33. N. Theodorakopoulos
Thermodynamic instabilities in one dimensional particle lattices: a finite-size scaling approach
Physical Review E **68**, 026109 (2003); arXiv:cond-mat/0306315

34. M. Barbi, S. Lepri, M. Peyrard and N. Theodorakopoulos
Thermal denaturation of a helicoidal DNA model
Physical Review E **68**, 061909 (2003); arXiv:cond-mat/0309454
35. N. Theodorakopoulos, M. Peyrard and R.S. MacKay
Nonlinear structures and thermodynamic instabilities in a one-dimensional lattice system
Physical Review Letters **93**, 258101 (2004); arXiv:cond-mat/0411188
36. N. Theodorakopoulos
Phase transitions in one dimension: are they *all* driven by domain walls?
Physica D **216**, 185 (2006); arXiv:cond-mat/0510437.
37. J. Errami, M. Peyrard and N. Theodorakopoulos
Modeling DNA beacons at the mesoscopic scale
European Physical Journal E **23**, 397 (2007); arXiv:0706.2458
38. N. Theodorakopoulos
DNA denaturation bubbles at criticality
Physical Review E **77**, 031919 (2008); arXiv:0802.2194
39. J-G. Hagmann, K.K. Kozlowski, N. Theodorakopoulos and M. Peyrard
On 4-point correlation functions in simple polymer models
Journal of Statistical Mechanics: Theory and Experiment P04011 (2009); arXiv:0903.4816
40. N. Theodorakopoulos
Melting of genomic DNA: predictive modeling by nonlinear lattice dynamics
Physical Review E **82**, 021905 (2010); arXiv:1007.2728
41. A. Wildes, N. Theodorakopoulos, J. Valle-Orero, S. Cuesta-López, J-L Garden and M. Peyrard
The thermal denaturation of DNA studied with neutron scattering
Physical Review Letters **106**, 048101 (2011); arXiv:1101.1797
42. N. Theodorakopoulos
Bubbles, clusters and denaturation in genomic DNA: modeling, parametrization and efficient computation
Journal of Nonlinear Mathematical Physics **18**, Suppl. 2, pp. 429-447 (2011); arXiv:1102.0259
43. A. Wildes, N. Theodorakopoulos, J. Valle-Orero, S. Cuesta-López, J-L Garden and M. Peyrard
Structural correlations and melting of B-DNA
Physical Review E **83**, 061923 (2011); arXiv:1106.2632
44. N. Theodorakopoulos and M. Peyrard
Base pair openings and temperature dependence of DNA flexibility
Physical Review Letters **108**, 078104 (2012); arXiv:1201.6561

45. S. Meyer, N. Theodorakopoulos, M. Peyrard, R. Lavery and R. Everaers
Temperature dependence of the DNA Double Helix at the Nanoscale: Structure, Elasticity, and Fluctuations
Biophysical Journal **105**, 1904 (2013).
46. J. Valle-Orero, A. Wildes, N. Theodorakopoulos, S. Cuesta-López, J-L Garden, S. Danilkin and M. Peyrard
Thermal denaturation of A-DNA
New Journal of Physics **16**, 113017 (2014).
47. K Wood, R. Knott, O. Tonchev, D. Angelov, N. Theodorakopoulos and M. Peyrard
Small angle scattering as a tool to study the thermal denaturation of DNA
Europhys. Lett. **108**, 18002 (2014).
48. A. González, A. Wildes, M. Marty-Roda, S. Cuesta-López, E. Mossou, A. Studer, B. Demé, G. Moiroux, J-L Garden, N. Theodorakopoulos, M. Peyrard
The melting transition of oriented DNA fibers submerged in polyethylene glycol solutions studied by neutron scattering and calorimetry
Journal of Physical Chemistry B **122**, 2504 (2018).
49. T. Schindler, A. González, R. Boopathi, M. Marty-Roda, L. Romero-Santacreu, A. Wildes, L. Porcar, A. Martel, N. Theodorakopoulos, S. Cuesta-López, D. Angelov, T. Unruh, M. Peyrard
Kinky DNA in solution: Small angle scattering study of a nucleosome positioning sequence
Physical Review E **98**, 042417 (2018); arxiv:1809.09335.
50. N. Theodorakopoulos
Thermodynamics of force-induced B-DNA melting: Single-strand discreteness matters
Physical Review E **99**, 032404 (2019); arxiv:1902.05780.

B. Books

1. N. Theodorakopoulos
Statistical Physics of DNA: An Introduction to Melting, Unzipping and Flexibility of the Double Helix
World Scientific (2019)
<https://doi.org/10.1142/11533>.

C. Book chapters and refereed conference proceedings

1. N. Theodorakopoulos, S. Hanna and R. Klein
Behavior of a ϕ^4 kink in the presence of an inhomogeneous perturbation
in *Solitons and Condensed Matter Physics*, A. R. Bishop and T. Schneider (Eds.), pp. 158-161, Springer (1978)
2. N. Theodorakopoulos
Dynamics of the Sine-Gordon chain: the kink-phonon interaction, soliton diffusion and dynamical correlations
in *Ordering in strongly fluctuating condensed matter systems*, T. Riste (Ed.), pp. 145-149, Plenum (1980)
3. N. Theodorakopoulos and R. Klein
Inherent effects of discretization in an interacting kink-phonon system
in *Physics in one dimension*, J. Bernasconi and T. Schneider (Eds.), pp. 100-103, Springer (1981)
4. N. Theodorakopoulos
Counting solitons and phonons in the Toda lattice
in *Statics and dynamics of nonlinear systems*, G. Benedek, H. Bilz and R. Zeyher (Eds.), pp. 271-277, Springer (1983)
5. N. Theodorakopoulos
Classical statistical mechanics of integrable systems
in *Dynamical problems in soliton systems*, S. Takeno (Ed.), pp. 115-121, Springer (1985)
6. N. Theodorakopoulos
Solitons: Dynamics, Statistics and the Bethe Ansatz
in *Proceedings of the 2nd International Conference on Phonon Physics*, J. Kollar *et al* (Eds.), pp. 468-477, World Scientific (1985)
7. N. Theodorakopoulos and N. C. Bacalis
Thermally excited lattice solitons
in *Proton transfer in hydrogen-bonded systems* (Ed. T. Bountis), pp. 131-137, Plenum (1991)
8. N. Theodorakopoulos
The statistical properties of lattice solitons
in *Nonlinear coherent structures in Physics and Biology* (Eds. K. Spatschek and F.G. Mertens), pp. 73-83, Plenum (1994)
9. N. Theodorakopoulos
Phase transitions in homogeneous biopolymers: basic concepts and methods
in *Localization and energy transfer in nonlinear systems*, L. Vazquez, R.S. MacKay and M.P. Zorzano (Eds.), pp. 130-152, World Scientific (2003); arXiv:cond-mat/0210188

10. N. Theodorakopoulos, M. Peyrard and T. Dauxois
Critical dynamics of DNA denaturation
in *Localization and energy transfer in nonlinear systems*, L.Vazquez,
R.S. MacKay and M.P. Zorzano (Eds.), pp. 239-247, World Scientific
(2003); arXiv:cond-mat/0211287
11. N. Theodorakopoulos
Statistical physics of localized vibrations
in “Energy Localisation and Transfer”, T. Dauxois, A. Litvak-Hinenzon,
R. MacKay & A. Spanoudaki (Eds.), *Advanced Series on Nonlinear
Dynamics - Vol.22*, pp. 341-353, World Scientific (2004).
12. N. Theodorakopoulos
Minimal modeling of DNA thermal and mechanical instabilities
Proceedings of a workshop on *Mathematical Methods and Models of
Continuum Biomechanics*
Oberwolfach Reports (European Mathematical Society) **2**, pp. 523-
526 (2005).

D. Doctoral Dissertation

1. N. Theodorakopoulos
Molecular relaxation and critical dynamics
Brown University 1971; thesis adviser: Leo Kadanoff; Digital Disser-
tations publication AAT 7302342

E. Lecture Notes

1. N. Theodorakopoulos
Selected topics in theoretical biophysics
University of Konstanz 2001, pp. 1-56
2. N. Theodorakopoulos
Nonlinear Physics: Solitons, Chaos, Discrete Breathers
University of Konstanz 2006, pp. 1-174
3. N. Theodorakopoulos
Die statistische Physik des DNA-Schmelzens
slightly adapted version of an inaugural lecture at the University of
Konstanz, 2003 (in German) pp. 1-14

F. Miscellaneous

1. N. Theodorakopoulos
R&D spending, extroversion and optimization of academic & research institutions
Symposium on research and technology, Association of Greek Researchers, Athens, 2005 (in Greek) pp. 1-3
2. N. Theodorakopoulos and M. Peyrard
Optimization of parameters in the Peyrard-Bishop-Dauxois model of DNA melting: a preliminary report
HPC-Europa2, Pan-European Research Infrastructure on High Performance Computing, 2012 report.