

Archive of Selected Publications + Topics

Statistical Mechanics (Co-authored by Marty Ferer, Jaan Oitmaa,...)

- ◆ M.J. Velgakis and M. Ferer, “*Series Evidence for a Fluctuation-Induced First-Order Transition in a bcc Ising Model with Competing Interactions*”, J. Appl. Phys. **53** (1982) 2689;
- ◆ M. Ferer and M.J. Velgakis, “*Hyperscaling in the Three-Dimensional Ising Model*”, Phys. Rev. B **27** (1983) 2839;
- ◆ M. Ferer and M.J. Velgakis, “*High Temperature Critical Behavior of Two-Dimensional Planar Models: A Series Investigation*”, Phys. Rev. B **27** (1983) 314-325;
- ◆ M.J. Velgakis and M. Ferer, “*Fluctuation-Induced First-Order Transition in a bcc Ising Model with Competing Interactions*”, Phys. Rev. B **27** (1983) 401-412;
- ◆ M. Ferer, A.H. Aidinejad, and M.J. Velgakis, “*The Specific Heat of Planar Spin Models*”, J. Appl. Phys. **55** (1984) 2438.
- ◆ J. Oitmaa, M.J. Velgakis, M.T. Bachelor and M.N. Barber, “*Critical Behaviour of the BNNI Model in Two Dimension*”, J. Magn. & Magn. Mater. **54-57** (1986) 665.
- ◆ J. Oitmaa and M.J. Velgakis, “*Extension of the High Temperature Free Energy Expansion for General Ising Systems*”, J. Phys. A: Math. Gen. **19** (1986) L553.
- ◆ J. Oitmaa and M.J. Velgakis, “*Low Temperature Series for the Square Lattice Ising Model with First- and Second-Neighbour Interactions*”, J. Phys. A: Math. Gen. **20** (1987) 1269.
- ◆ J. Oitmaa and M.J. Velgakis, “*Critical Behaviour of the Two-Dimensional Biaxial Next-Nearest-Neighbour Ising Model: Series Expansions*”, J. Phys. A: Math. Gen. **20** (1987) 1495.
- ◆ D. Hansel, J.M. Maillard, J. Oitmaa, M.J. Velgakis, “*Analytical Properties of the Anisotropic Cubic Ising Model*”, J. Stat. Phys. **48** (1987) 69;
- ◆ M.J. Velgakis, J. Oitmaa, “*Critical Behaviour of the Two-Dimensional Biaxial Next-Nearest-Neighbour Ising Model: A Monte Carlo Study*”, J. Phys. A: Math. Gen. **21** (1988) 547;
- ◆ C.M. Soukoulis, G.S. Grest, and M.J. Velgakis, “*Dimensional-Crossover Studies of Randomly Diluted Ferromagnetic Thin Films*”, J. de Phys. Coll. C **8**, 49 Suppl. (1988) 1205.
- ◆ C.M. Soukoulis, G.S. Grest and M.J. Velgakis, “*Monte Carlo Study of Randomly Diluted Ferromagnetic Thin Films*”, Phys. Rev. B **40** (1989) 467.
- ◆ M.J. Velgakis, “*Site-Diluted Two-Dimensional Ising Model with Competing Interactions*”, Physica A **159** (1989) 167.
- ◆ C.M. Soukoulis, M.C. Tringides, and M.J. Velgakis, “*Growth kinetics of a nonequilibrium Ising model*”, Mod. Phys. Lett. B **14** (2000) 983;
- ◆ M.J. Velgakis, “*Finite Lattice Calculations on Discrete Models*”, J. Comp. Theor. Nanosci. **3** (2006) 296-300;

- ♦ M.J. Velgakis, “*Domain Growth Kinetics with Conserved Dynamics*”, in “*Surface Diffusion: Atomistic and Collective Processes*”, NATO ASI B **360** (1997) 643.
- ♦ M. Ifti, Q. Li, C.M. Soukoulis, and M.J. Velgakis, “*A study of 2D Iging ferromagnets with dipolar interactions*”, Mod. Phys. Lett. B **15** (2001) 895.

Condensed Matter Theory

- ♦ Z. Xiong, M.J. Velgakis, N.C. Bacalis, “*Analytic Atomic Wave Functions of NMCSCF Quality: Applications*”, Int. J. Quant. Chem. **104** (2005) 418-429;
- ♦ C.M. Soukoulis, M.J. Velgakis, and E.N. Economou, “*One-dimensional Localization with Correlated Disorder*”, Phys. Rev. B **50** (1994) 5110.

Celestial Mechanics

- ♦ V.V. Markellos, A.E. Roy, M.J. Velgakis, S.S. Kanavos, “*A Photogravitational Hill Problem and Radiation Effects on Hill Stability of Orbits*”, Astrophys. Space Sci. **271** (2000) 293.

Nonlinear Dynamics (Co-authored by Stefanos Pnevmatikos, Yuri Kivshar,,...)

- ♦ Stefanos Pnevmatikos, A.V. Savin, A.V. Zolotaryuk, Yu. S. Kivshar, and M.J. Velgakis, “*Nonlinear Transport in Hydrogen-Bonded Chains: Free Solitonic Excitations*”, Phys. Rev. A **43** (1991) 5518.
- ♦ Stefanos Pnevmatikos, A.V. Savin, I. Stylianou, M.J. Velgakis, and A.V. Zolotaryuk, “*Proton Transport by solitons*”, Physica D **51** (1991) 316.
- ♦ Stefanos Pnevmatikos, Yuri S. Kivshar, M.J. Velgakis, A.V. Zolotaryuk, “*Breathers in Hydrogen-Bonded Chains*”, Phys. Lett. A **173** (1993) 43;
- ♦ Yuri S. Kivshar, A.V. Savin, M.J. Velgakis, A.V. Zolotaryuk, “*Nonlinear Transport in Hydrogen-Bonded Chains: Solitons under External Fields and Damping*”, Int. J. Mod. Phys. B **8** (1994) 1033;
- ♦ O.O. Vakhnenko and M.J. Velgakis, “*Transverse and Longitudinal Dynamics of Nonlinear Intramolecular Excitations on Multileg Ladder Lattices*”, Phys. Rev. E **61** (2000) 7110;
- ♦ O.O. Vakhnenko and M.J. Velgakis, “*Slalom soliton dynamics on a ladder lattice with zig-zag distributed impurities*”, Phys. Lett. A **278** (2000) 59.
- ♦ O.O. Vakhnenko and M.J. Velgakis, “*Multimode soliton dynamics in perturbed ladder lattices*”, Phys. Rev. E **63** (2001) 16612;
- ♦ Julia M. Khalack and M.J. Velgakis, “*Orientational Discrete Breathers on Hydrogen-Bonded Chains*”, Phys. Rev. E **65** (2002) 046604;
- ♦ Julia M. Khalack and M.J. Velgakis, “*Comment on Dynamic properties of proton transfer in hydrogen-bonded molecular systems*”, J.Phys: Conden Matter **14** (2002) 4747.

Function Approximation (Co-authored by George A. Baker,Jr.,...)

- ♦ M.J. Velgakis, G.A. Baker, Jr., J. Oitmaa, “*Integral Approximants*”, Computer Phys. Comm. **99** (1997) 307;
- ♦ G.A. Baker, Jr., J. Oitmaa, and M.J. Velgakis, “*Series Analysis of Multivalued Functions*”, Phys. Rev. A **38** (1988) 5316.

Material Science (Co-authored by Constantine Politis,....)

- ♦ P. Pouloupoulos, S.D. Pappas, V. Kapaklis, P.E. Jönsson, E.Th. Papaioannou, A. Delimitis, D. Trachylis, M.J. Velgakis, E.I. Meletis, C. Politis, “*Growth and Magnetism of Natural Multilayers*”, J. Nano Research, **15** (2011) 95-103;
- ♦ S.D. Pappas, P. Pouloupoulos, V. Kapaklis, S. Grammatikopoulos, D. Trachylis, M.J. Velgakis, E.I. Meletis, and C. Politis, “*Growth and Experimental Evidence of Quantum Confinement*”, J. Nano Research **15** (2011) 69-74;
- ♦ S.D. Pappas, V. Kapaklis, A. Delimitis, P.E. Jönsson, E.Th. Papaioannou, P. Pouloupoulos, P. Fumagalli, D. Trachylis, M.J. Velgakis, C. Politis, “*Layering and temperature-dependent magnetization and anisotropy of naturally produced Ni/NiO multilayers*”, J. Appl. Phys., **112** (2012) 053918;
- ♦ Vlachos, S.D. Pappas, V. Kapaklis, V. Karoutsos, A. Kordatos, F. Wilhelm, A. Rogalev, P. Fumagalli, P. Pouloupoulos, M.J. Velgakis, C. Politis, “*Magnetic Properties of Textured CoPd Nanocrystalline Thin Films*”, J. Nanosci Nanotech, **12** (2012) 6240–6247;
- ♦ S. Grammatikopoulos, S. D. Pappas, V. Dracopoulos, P. Pouloupoulos, P. Fumagalli, M.J. Velgakis, C. Politis, “*Self-assembled Au nanoparticles on heated Corning glass by dc magnetron sputtering: size-dependent surface plasmon resonance tuning*”, J Nanopart Res **15** (2013) 1446;
- ♦ S.D. Pappas, P. Pouloupoulos, V. Karoutsos, P. Fumagalli, M.J. Velgakis, and C. Politis, “*Observation of Irregular Labyrinthine Magnetic Domains with Dendritic Edges in a Co-Rich CoCu Alloyed Film*”, J. Surf. Interface Mat. **1** (2013) 93-96;
- ♦ S.D. Pappas, S. Grammatikopoulos, P. Pouloupoulos, D. Trachylis, M.J. Velgakis, E.I. Meletis, W. Schommers and C. Politis, “*Growth, structure and optical properties of ChNi-oxide films for nanophotonics and photovoltaics*”, J. Nano Research **25** (2013) 61-66;
- ♦ S. Grammatikopoulos, S.D. Pappas, D. Trachylis, V. Kapaklis, P. Pouloupoulos, Noorhana Yahya, C. Politis, and M.J. Velgakis, “*Cu-Induced Crystallization of Si in CuSi Alloyed Films and the Formation of Natural Multilayers by Oxidation*”, J. Nanosci. Nanotech., **1** (2013) 136–142.
- ♦ S.D. Pappas, A. Delimitis, V. Kapaklis, E.Th. Papaioannou, P. Pouloupoulos, D. Trachylis, M.J. Velgakis, and C. Politis, “*Natural Nanomorphous Ni/NiO Magnetic Multilayers: Structure and Magnetism of the High-Pressure Series*”, J. Nanosci. Nanotech., **14** (2014) 1-5.
- ♦ P. Pouloupoulos, A. Goschew, S.D. Pappas, V. Karoutsos, A. Straub, P. Fumagalli, M.J. Velgakis, W. Schommers, and C. Politis, “*Graphene-Assisted Growth of Nanoparticles of Single-Crystalline Epitaxial Nickel Disilicides on Si(001)*”, J. Surf. Interface Mat. **2** (2014) 161-165.

- ♦ S. Grammatikopoulos, N. Lagos, M.M. Sigalas, P. Pouloupoulos, S.D. Pappas, A.G. Chronis, V. Dracopoulos, D. Trachylis, M. J. Velgakis, and C. Politis, “*Hybrid AgAu Nanoparticles in GeO Matrix with Enhanced Plasmonic Resonances*”, J. Surf. Interface Mat. **2** (2014) 227–232.
- ♦ S.D. Pappas, S. Grammatikopoulos, P. Pouloupoulos, D. Trachylis, M.J. Velgakis, and C. Politis, “*Growth and Optical Properties of Thin NiO Films*”, J. Surf. Interface Mat. **2** (2014) 233–237.
- ♦ P. Pouloupoulos, A. Vlachos, S. Grammatikopoulos, V. Karoutsos, P.S. Ioannou, N. Bebelos, D. Trachylis, M. J. Velgakis, E. I. Meletis, and C. Politis, “*Texture and magnetism of nanocrystalline Ni films and multilayers*”, J. Nano Research **30** (2015) 68-77.
- ♦ P. Pouloupoulos, S. Grammatikopoulos, D. Trachylis, G. Bissas, I. Dragatsikas, M. J. Velgakis, and C. Politis, “*Growth and Optical Properties of Nanocrystalline Titania Films for Optoelectronics and Photovoltaics*”, J. Surf. Interface Mat. **3** (2015) 1–8

Books

- ♦ “*Υπολογιστική Φυσική*” (*Computational Physics, in Greek*), M. I. Βεργάκης (Εκδόσεις Πανεπιστημίου Αιγαίου, Καρλόβασι 1991).
- ♦ “*Σύγχρονη Φυσική*” (*Modern Physics, in Greek*), M. I. Βεργάκης (Εκδόσεις Πανεπιστημίου Πατρών, Πάτρα 1994).
- ♦ “*Κλασική Μηχανική*” (*Classical Mechanics, in Greek*), M. I. Βεργάκης (Πανεπιστήμιο Κρήτης, Ηράκλειο 2005).
- ♦ “*Εργαστηριακή Φυσική*” (*Laboratory Physics, in Greek*), M. I. Βεργάκης (Εκδόσεις ΣΥΜΜΕΤΡΙΑ, Αθήνα 2012).