

CURRICULUM VITAE

MARK JOHN BOWICK

Professor of Physics and Director of the Soft Matter Program
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Date of Birth: November 29, 1957, Rotorua, New Zealand
Citizenship: New Zealand
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ACADEMIC SPECIALIZATION

Condensed Matter Theory (Soft Matter) & Mathematical Physics

EDUCATION

B.Sc. (Hons.) University of Canterbury, New Zealand - 1977
M.S. (Physics) California Institute of Technology - 1979
Ph.D. (Physics) California Institute of Technology - 1983

PROFESSIONAL EMPLOYMENT

1983 - 1986 Research Associate Physicist, Yale University
1986 - 1988 Sponsored Research Staff, Center for Theoretical Physics and
Laboratory for Nuclear Science, M.I.T
1987 - 1993 Assistant Professor of Physics, Syracuse University
1993 - 1998 Associate Professor of Physics, Syracuse University
1998 - present Full Professor of Physics, Syracuse University
Jan. 1989 - Aug. 1989 Visiting Scholar in Physics, Harvard University
July 1989 - June 1991 Associate of the Dept. of Physics of Harvard University
Jan. - Aug. 1991 Visiting Member of the Institute for Theoretical Physics,
University of California at Santa Barbara
Jan. - Mar. 1993 Visiting Member of the Institute for Theoretical
Physics, University of California at Santa Barbara
Aug. - Dec. 1994 Visiting Member of the Institute for Theoretical
Physics, University of California at Santa Barbara.
Feb. 22-March 17 1997 Visitor to the Theory Group, Saclay, Paris, France

April 3-25 1997 Visitor to the Niels Bohr Institute, Copenhagen, Denmark
May 18-May 25 1997 Visitor to the Dept. of Mathematics, Heriot-Watt University, Edinburgh.
May 26-June 5 1997 Visitor and Lecturer at Trinity College, Dublin, Ireland
September 1 1998- June 30 1999, Visiting Professor of Physics, Harvard University
July 1 1999-June 30 2000 Associate of the Physics Department, Harvard University

GRANTS

1987-1994, Department of Energy, Outstanding Junior Investigator Award.
Funding for 7/1/87-12/31/94: \$255,000.

Cost-Sharing Grants from Office of Sponsored Programs, Syracuse University.
Funding for 7/1/89-6/30/94: \$155,000.

Jan. 1995 - 2003, Co-Principal Investigator on Dept. of Energy Group Grant.

National Science Foundation Grant: *Statistical Physics and Computational Complexity* (with Cristina Marchetti and Alan Middleton): \$474,000 (Aug. 1, 2002-Dec. 1, 2007).

National Science Foundation Grant: *Order and Defects in Soft Matter Architecture*: \$240,000 (May 1, 2009-April 30, 2013).

AWARDS

New Zealand Junior Scholarship, 1973.

Haydon Prize for Physics, University of Canterbury, 1976.

Sir George Grey Scholarship, University of Canterbury, 1976.

Commonwealth Scholarship (declined) 1977.

1851 Science Exhibition Research Scholarship (declined), 1977.

Earle C. Anthony Fellowship, California Institute of Technology, 1977.

Fourth prize award in the 1985 Gravity Research Foundation Essay Competition.

First prize award in the 1986 Gravity Research Foundation Essay Competition.

Outstanding Junior Investigator Award, D.O.E. – 1987 - 1994.

Third prize award in the 1989 Gravity Research Foundation Essay Competition.

Fourth prize award in the 1992 Gravity Research Foundation Essay Competition.

Fellow of the American Physical Society, DCMP – elected 2004.

Chancellor's Citation for Exceptional Academic Achievement
(Syracuse University, 2006).

William Wasserstrom Prize for Excellence in Graduate Teaching and Advising
(Syracuse University, 2009).

PROFESSIONAL SOCIETIES

American Physical Society & Materials Research Society

PUBLICATIONS OF MARK J. BOWICK

1. “Regge Symmetries and Null $3 - j$ and $6 - j$ Symbols,” Thesis, University of Canterbury, Christchurch, New Zealand, 1976.
2. “Basic Properties of the Exceptional Lie Groups” (with B. G. Wybourne), *Aust. J. Phys.* **30** (1977) 259.
3. “Calculable Masses in Grand Unified Theories” (with P. Ramond), *Phys. Lett.* **B103** (1981) 338. (Reprinted in *Unity of Forces in the Universe*, A. Zee, ed. (World Scientific, Singapore, 1982)).
4. “Suppression of Lepton Number Violation Mediated by $\Delta I = 0$ Mass Fermions” (with F. del Aguila), *Phys. Lett.* **B119** (1982) 144.
5. “The Possibility of New Fermions with $\Delta I = 0$ Mass” (with F. del Aguila), *Nucl. Phys.* **B224** (1983) 107.
6. “ $B-L$ Violation in Supersymmetric $SU(5)$ ” (with M. K. Chase and P. Ramond), *Phys. Lett.* **B128** (1983) 185.
7. “Is the Higgs(ino) Color Triplet Light?” (with P. Ramond), *Phys. Lett.* **B131** (1983) 367.
8. “Isospin Symmetry Breaking with a Dynamical Higgs Sector” (with T. Appelquist), LBL preprint LBL-18571 (1984) and published in *Berkeley SSC Workshop 1984:37* (QCD 184:57:1984).
9. “Low Energy Signals of Composite Models,” presented at Summary of SSC Theoretical Workshop, Berkeley, CA, June 4 – 22, 1984 and DPF 1984 Summer Study for Design and Utilization of SSC, Snowmass, CO, June 23 – July 13, 1984. Published as LBL preprint LBL-18571 (1984) and in *Berkeley SSC Workshop 1984:37* (QCD: 184:57:1984) and in *Snowmass Summer Study 1984:795* (QCD 161:D15:1984).
10. “Lower and Upper Bounds on the Radius of Composite Quarks and Leptons” (with I. Bars and K. Freese), *Phys. Lett.* **138B** (1984) 159.
11. “Isospin Symmetry Breaking in Electroweak Theories” (with T. Appelquist, E. Cohler and A. I. Hauser), *Phys. Rev. Lett.* **53** (1984) 1523.
12. “Breaking of Isospin Symmetry in Theories with a Dynamical Higgs Mechanism” (with T. Appelquist, E. Cohler and A. I. Hauser), *Phys. Rev.* **D31** (1985) 1676.
13. “ $\gamma-Z$ Kinetic Mixing as Signal of a Higher Scale” (with I. Bars), *Phys. Rev. Lett.* **54** (1985) 392.
14. “Superstrings at High Temperature” (with L. C. R. Wijewardhana), *Phys. Rev. Lett.* **54** (1985) 2485.

15. “Superstrings at High Temperature”, Invited talk in *Proceedings of Symposium on Anomalies, Geometry and Topology*, Argonne National Laboratory, March 28 – 30, 1985, W. Bardeen and A. White, eds. (World Scientific, Singapore), p. 371.
16. “Chiral Symmetry Breaking in $2 + 1$ -Dimensions” (with T. Appelquist, E. Cohler and L. C. R. Wijewardhana), *Phys. Rev. Lett.* **55** (1985) 1715.
17. “Superstring Gravity and the Early Universe” (with L. C. R. Wijewardhana), *Gen. Rel. Grav.* **18** (1986) 59. (Fourth prize winner in the 1985 Gravity Research Foundation Essay Competition.)
18. “High Energy Physics 1985,” *Proceedings of the Theoretical Advanced Study Institute at Yale*, Vols. I and II, June 1985, M. J. Bowick and F. Gürsey, eds. (World Scientific, Singapore, 1986).
19. “Role of String Excitations in the Last Stages of Black Hole Evaporation” (with L. Smolin and L. C. R. Wijewardhana), *Phys. Rev. Lett.* **56** (1986) 424.
20. “The Thermodynamics of Superstrings,” Invited talk in *Proceedings of the 1985 Meeting of the Division of Particles and Fields of the American Physical Society*, Oregon, August 12 – 15, R. C. Hwa, ed. (World Scientific, Singapore, 1986), pp. 805–812.
21. “The Algebraic Structure of BRST Quantization” (with F. Gürsey), *Phys. Lett.* **175B** (1986) 182.
22. “Fractional Spin via Canonical Quantization of the $O(3)$ Non-Linear Sigma Model” (with D. Karabali and L. C. R. Wijewardhana), *Nucl. Phys.* **B271** (1986) 417.
23. “Spontaneous Chiral Symmetry Breaking in Three-Dimensional QED” (with T. Appelquist, D. Karabali and L. C. R. Wijewardhana), *Phys. Rev.* **D33** (1986) 3704.
24. “Spontaneous Breaking of Parity in $2 + 1$ -Dimensional QED” (with T. Appelquist, D. Karabali, and L. C. R. Wijewardhana), *Phys. Rev.* **D33** (1986) 3774.
25. “Does String Theory Solve the Puzzles of Black Hole Evaporation?” (with L. Smolin and L. C. R. Wijewardhana), *Gen. Rel. Grav.* **19** (1987) 113. (First prize winner in the 1986 Gravity Research Foundation Essay Competition.)
26. “The BRST Charge Operator as a Generator of Non-Linear Transformations of the Constraint Superalgebra” (with F. Gürsey), *Nucl. Phys.* **B283** (1987) 331.
27. “String Theory as the Kähler Geometry of Loop Space” (with S. G. Rajeev), *Phys. Rev. Lett.* **58** (1987) 535.
28. “The Holomorphic Geometry of Closed Bosonic String Theory and $\text{Diff } S^1/S^1$ ” (with S. G. Rajeev), *Nucl. Phys.* **B293** (1987) 348.

29. “Anomalies as Curvature in Complex Geometry” (with S. G. Rajeev), *Nucl. Phys.* **B296** (1988) 1007.
30. “The Geometry of String Theory,” in *Proceedings of the Eighth Workshop on Grand Unification*, K. C. Wali, ed. (World Scientific, Singapore, 1988).
31. “The Complex Geometry of String Theory and Loop Space,” (with S. G. Rajeev), in *Frontiers in Particle Theory: Proceedings of the Johns Hopkins Workshop on Current Problems in Particle Theory* 11, Eds. Yi-shi Duan, G. Domokos and S. Kovesi-Domokos (World Scientific, Singapore, 1988).
32. “The Ricci Curvature Of $DiffS^1/SL(2,\mathbf{R})$ ” (with A. Lahiri), *J. Math. Phys.* **29** (1988) 1979.
33. “Symmetries of the Hubbard Model and the θ -Term in the σ -Model” (with A. P. Balachandran, K. S. Gupta and A. M. Srivastava), *Mod. Phys. Lett.* **A3** (1988) 1725.
34. “Axionic Black Holes and an Aharanov-Bohm Effect for Strings” (with S. Giddings, J. A. Harvey, G. Horowitz and A. Strominger), *Phys. Rev. Lett.* **61** (1988) 2823.
35. “The Low-Energy Limit of String Theory from the Geometry of Loop Space” (with A. Lahiri), *Phys. Lett.* **B217** (1989) 281.
36. “High-Temperature Strings” (with S. Giddings), *Nucl. Phys.* **B325** (1989) 631.
37. “Axionic Black Holes,” (with T.J. Allen and A. Lahiri), in the *Proceedings of the Eleventh Annual Montreal-Rochester-Syracuse-Toronto Meeting* (May 1989), ed. C. Rosenzweig and K.C. Wali (pp.1-7).
38. “Axionic Black Holes and Wormholes,” *Gen. Rel. Grav.* **22** (1990) 137. (Third prize winner in the 1989 Gravity Research Foundation Essay Competition.)
39. “Axionic Black Holes from Massive Axions,” (with T.J. Allen and A. Lahiri), *Phys. Lett.* **B237** (1990) 47.
40. “Winding Modes and Strings at Finite Temperature,” in the *Proceedings of the 1989 Summer School In High Energy Physics and Cosmology: The ICTP Series in Theoretical Physics - Volume 6*, eds. J. C. Pati, S. Randjbar-Daemi, E. Sezgin and Q. Shafi, World Scientific, Singapore, 1990.
41. “Mass Generation Without Symmetry Breaking,” (with T. J. Allen and A. Lahiri), in the *Proceedings of the Twelfth Annual MRST Meeting*, Montreal, May 14-15, 1990, eds. B. Margolis and P. Valin.
42. “Topological Mass Generation in 3+1 Dimensions,” (with T.J. Allen and A. Lahiri), *Mod. Phys. Lett.* **A6** (1991) 559.

43. “String Equations of Motion from Vanishing Curvature,” (with KongQing Yang), *Int. Jour. Mod. Phys.* **A6** (1991) 1319.
44. “Reduced Unitary Matrix Models and the Hierarchy of τ -Functions,” (with A. Morozov and D. Shevitz), *Nucl. Phys.* **B354** (1991) 496.
45. “Universal Scaling of the Tail of the Density of Eigenvalues in Random Matrix Models,” (with E. Brézin), *Phys. Lett.* **B268** (1991) 21.
46. “An Operator Formalism for Unitary Matrix Models,” (with K. Anagnostopoulos and N. Ishibashi); *Mod. Phys. Lett.* **A6** (1991) 2727.
47. “Quantum Statistical Mechanics and Multiplicative Number Theory,” in *Thermal Field Theories, the Proceedings of the 2nd Workshop on Thermal Field Theories and Their Applications*, Tsukuba, Japan, July 23-27, 1990, eds. H. Ezawa, T. Arimitsu and Y. Hashimoto, North-Holland, Amsterdam, 1991.
48. “Curiosities of Arithmetic Gases,” (with I. Bakas), *J. Math. Phys.* **32** (1991) 1881.
49. “The Discrete Integrability of Matrix Models,” ITP Santa Barbara preprint NSF-ITP-91-63i, in the *Proceedings of the 13th Annual MRST Meeting*, Rochester, May 6-7, 1991, pps. 49-69, ed. C. Hagen.
50. “The Discrete Integrability of Matrix Models of 2D-Gravity,” in *Strings and Symmetries 1991*, Eds. N. Berkovits et al, World Scientific, Singapore (1992).
51. “The Solution Space of the Unitary Matrix Model String Equation and the Sato Grassmannian,” (with K. Anagnostopoulos and A.S. Schwarz); *Commun. Math. Phys.* **148** (1992) 469-485.
52. “Unitary One Matrix Models: String Equation and Flows,” (with K. Anagnostopoulos); SU preprint SU-4238-504 (1992), to appear in *Proc. Vth Regional Conference on Mathematical Physics*, Edirne, Turkey; December 15-22, 1991.
53. “Quantum Gravity, Random Geometry and Critical Phenomena,” (with E. Marinari); (Fourth prize winner in the 1992 Gravity Research Foundation Essay Competition); *Gen. Rel. Grav.* **24** (1992) 1209.
54. “Multicriticality, Scaling Operators and mKdV Flows for the Symmetric Unitary One Matrix Models,” (with K. Anagnostopoulos); in *Proc. XIVth Annual MRST Meeting*, Toronto May 7-8, 1992; Ed. P. J. O’Donnell.
55. “The Cosmological Kibble Mechanism in the Laboratory: String Formation in Liquid Crystals,” in the *Proc. International Workshop of Theoretical Physics*, Erice, 6th Session 1992: “String Quantum Gravity and Physics at the Planck Energy Scale,” Ed. N. Sanchez, World Scientific, Singapore, 1993 and in the *Proc. First Iberian Meeting on Gravity*, Évora, Portugal, 1992: “Classical and Quantum Gravity,” Eds. M. Bento et al, World Scientific, Singapore, 1993.

56. “Fluid Random Surfaces with Extrinsic Curvature: II,” (with K.N. Anagnostopoulos, P. Coddington, M. Falcioni, L. Han, G. Harris and E. Marinari); *Phys. Lett.* **B317** (1993) 102.
57. “The phase diagram of fluid random surfaces with extrinsic curvature,” (with P. Coddington, L. Han, G. Harris and E. Marinari); *Nucl. Phys.* **B394** (1993) 791.
58. “Finite Temperature Strings,” SU preprint SU-HEP-4241-522; in the *Proc. International Workshop of Theoretical Physics*, Erice, 6th Session (1992): “String Quantum Gravity and Physics at the Planck Energy Scale,” Ed. N. Sanchez, World Scientific, Singapore, 1993.
59. “Strings with Extrinsic Curvature: An Analysis of the Crossover Regime,” (with P. Coddington, L. Han, G. Harris and E. Marinari); *Nucl. Phys. B (Proc. Suppl.)* **30** (1993) 795.
60. “The Phase Structure of Strings with Extrinsic Curvature,” (with P. Coddington, L. Han, G. Harris and E. Marinari); SU preprint SU-HEP-4241-526; in the *Proc. International Workshop of Theoretical Physics*, Erice, 6th Session 1992: “String Quantum Gravity and Physics at the Planck Energy Scale,” Ed. N. Sanchez, World Scientific, Singapore, 1993 and in the *Proc. First Iberian Meeting on Gravity*, Évora, Portugal, 1992: “Classical and Quantum Gravity,” Eds. M. Bento et al, World Scientific, Singapore, 1993.
61. “Random Surfaces and Quantum Gravity: Looking for the Emergence of Continuum Theories from Triangulated Manifolds,” (with B. Bruegmann, P. Coddington, L. Han, G. Harris and E. Marinari); in the *Proc. of the Conference String Theory, Quantum Gravity and the Unification of the Fundamental Interactions*, eds. M. Bianchi, F. Fucito, E. Marinari and A. Sagnotti (World Scientific, Singapore, 1993).
62. “Computer Science Software Tools and Languages to Support Computational Physics,” *A Report to the IBM Corporation* (with G. Fox, J. Apostolakis, B. Bruegmann, P. Coddington, D. Edelsohn, L. Han, G. Harris, E. Marinari, K. Mills and Sanjay Ranka).
63. “Optimization of a Dynamic Random Surface Code for RISC Processors,” (with P. Coddington, L. Han, G.C. Fox, G. Harris and E. Marinari), SU-HEP-93-4241-546.
64. “The Cosmological Kibble Mechanism in the Laboratory: String Formation in Liquid Crystals,” (with L. Chandar, E. Schiff and A. M. Srivastava); *Science* **263** (1994) 943-945.
65. “Critical Slowing Down of Cluster Algorithms for Ising Models Coupled to 2-d Gravity,” (with M. Falcioni, G. Harris and E. Marinari), *Phys. Lett.* **B322** (1994) 316 (hep-lat/9311036).

66. “Two Ising Models Coupled to 2-Dimensional Gravity,” (with M. Falcioni, G. Harris and E. Marinari), *Nucl. Phys.* **B419** (1994) 665-684 (hep-th/9310136).
67. “Multiple Ising Models Coupled to 2-d Gravity: a CSD Analysis,” (with M. Falcioni, G. Harris and E. Marinari), *Nucl. Phys. B Proc. Suppl.* **34** (1994) 717-719.
68. “Scaling and the Fractal Geometry of Two-Dimensional Quantum Gravity,” (with S.Catterall, G. Thorleifsson and V. John), *Phys. Lett.* **B354** (1995) 58-68.
69. “Cosmology in the Laboratory,” in **PASCOS 94**, Proceedings of the Fourth International Symposium on Particles, Strings and Cosmology, Ed. K. C. Wali (World Scientific, Singapore, 1995) pp.433-442.
70. “Three-Dimensional Folding of the Triangular Lattice,” (with P. Di Francesco, O. Golinelli and E. Guitter), *Nucl. Phys.* **B450** [FS] (1995) 463 (cond-mat/9502063).
71. “The Phase Diagram of Crystalline Surfaces,” (with K. Anagnostopoulos, S. Catterall, M. Falcioni and G. Thorleifsson), *Nucl. Phys. B Proc. Suppl.* **47** (1996) 838-841 (hep-lat/9509074).
72. “The Flat Phase of Crystalline Membranes,” (with K. Anagnostopoulos, S. Catterall, M. Falcioni and G. Thorleifsson), *J. Phys.I France* **6** (1996) 1321 (cond-mat/9603157).
73. “Minimal Dynamical Triangulations of Random Surfaces,” (with S. Catterall and G. Thorleifsson), *Phys. Lett.* **B391** (1997) 305 (hep-th/9605167).
74. “The Elastic Properties of a Flat Crystalline Membrane,” (with S. Catterall, M. Falcioni, G. Thorleifsson and K. Anagnostopoulos), in MRST '96 “Current Ideas in Theoretical Physics,” Eds. P.J. O'Donnell and B. Hendee Smith (World Scientific, Singapore, 1996), pp.143-152.
75. “The Hausdorff Dimension of Surfaces in Two-Dimensional Quantum Gravity Coupled to Ising Minimal Matter,” (with V. John and G. Thorleifsson), *Phys. Lett.* **B403** (1997) 197 (hep-th/9608030).
76. “The Flat Phase of Fixed-Connectivity Membranes,” (with S. Catterall, M. Falcioni, G. Thorleifsson and K. Anagnostopoulos), *Nucl. Phys. B Proc. Suppl.* **53** (1997) 746-752 (hep-lat/9608044).
77. “Suppressing Curvature Fluctuations in Dynamical Triangulations,” (with S. Catterall and G. Thorleifsson), *Nucl. Phys. B Proc. Suppl.* **53** (1997) 753-755 (hep-lat/9608076).
78. “Simulating Crystalline Membranes,” (with G. Thorleifsson, S. Catterall, M. Falcioni and K. Anagnostopoulos), in **Multiscale Phenomena and their Simulation** (pp.119-123), Proceedings of the International Conference (Bielefeld, Germany;

Sept. 30 – Oct. 4, 1996), Eds. B. Monien, F. Karsch and H. Satz (World Scientific, Singapore, 1997).

79. “The Poisson Ratio of Crystalline Surfaces,” (with M. Falcioni, E. Gutter and G. Thorleifsson), *Europhys. Lett.* **38** (1997) 67-72 (cond-mat/9610007).
80. “Discrete Folding,” (with P. Di Francesco, O. Golinelli and E. Gutter), Proceedings of the 4th Chia Meeting on *Condensed Matter and High Energy Physics*, Chia, Sardinia, Sept. 3 – 10, 1995: Eds; A. Barone and A. Devoto, Istituto Italiano per gli Studi Filosofici pp.21-33 (cond-mat/9610215).
81. “Geometrical Folding Transitions of the Triangular Lattice in the Face-Centered Cubic Lattice,” (with O. Golinelli, E. Gutter and S. Mori), *Nucl. Phys.* **B495** [FS] (1997) 583-607 (cond-mat/9611105).
82. “Effects of Self-Avoidance on the Tubular Phase of Anisotropic Membranes,” (with E. Gutter), *Phys. Rev.* **E56** (1997) 7023 (cond-mat/9705045).
83. “Numerical Observation of a Tubular Phase in Anisotropic Membranes” (with M. Falcioni and G. Thorleifsson): *Phys. Rev. Lett.* **79** (1997) 885 (cond-mat/9705059).
84. “Phase Transitions,” in the 1997 McGraw-Hill Yearbook of Science & Technology, pp. 357-360.
85. “Random Surfaces and Lattice Gravity,” (hep-lat/9710005); *Nucl. Phys.* **B** Proc. Suppl. 63A-C (1998) 77-88.
86. “Domain Formation in Finite-Time Quenches,” (with Arshad Momen), *Phys. Rev.* **D58** (1998) 085014 (hep-ph/9803284).
87. “Tubular phase of self-avoiding anisotropic crystalline membranes,” (with Alex Travesset), *Phys. Rev.* **E59** (1999) 5659 (cond-mat/9808214).
88. “New Analytical Results on Anisotropic Membranes,” (with Alex Travesset), *Nucl. Phys.* **B** Proc. Suppl. 73 (1999) 807 (hep-lat/9809110).
89. “Anisotropic Membranes,” (with S. Catterall, S. Warner, G. Thorleifsson and M. Falcioni): *Nucl. Phys.* **B** Proc. Suppl. 73 (1999) 805 (hep-lat/9809112).
90. “Interacting Topological Defects on Frozen Topographies,” (with D. R. Nelson and A. Travesset), *Phys. Rev.* **B62** (2000) 8738 (arXiv:cond-mat/9911379).
91. “The Statistical Mechanics of Membranes,” (with Alex Travesset), (in “Renormalization Group Theory In The New Millennium,” D. O’Connor and C.R. Stephens (Eds.) *Phys. Rep.* **344** (4-6) (2001) 255-308 (arXiv:cond-mat/0002038).
92. “The Geometrical Structure of 2D Bond-Orientational Order,” (with Alex Travesset), *J. Phys.* **A34** (2001) 1535 (arXiv:cond-mat/0005356).

93. “Universality Classes of Self-Avoiding Fixed-Connectivity Membranes,” (with Angelo Cacciuto, Gudmar Thorleifsson and Alex Traveset), *Eur. Phys. J* **E5** (2001) 149 (arXiv:cond-mat/0006383).
94. “The Universal Negative Poisson Ratio of Self-Avoiding Fixed-Connectivity Membranes,” (with Angelo Cacciuto, Gudmar Thorleifsson and Alex Traveset): *Phys. Rev. Lett.* **87** (2001) 148103 (arXiv:cond-mat/0103173).
95. “The Ising Model on a Dynamically Triangulated Disk with a Boundary Magnetic Field,” (with Scott McGuire, Simon Catterall and Simeon Warner), *Nucl. Phys.* **B614** (2001) 467 (arXiv:hep-lat/0105002).
96. “The formation of vortex loops (strings) in continuous phase transitions,” (with Angelo Cacciuto and Alex Traveset), *Phys. Rev.* **E65** (2002) 026133 (arXiv:cond-mat/0107188).
97. “Spherical Crystals,” *J. Phys. IV France* **12** (2002) 221 (Proceedings of ECRYS-2002).
98. “Crystalline Order on a Sphere and the Generalized Thomson Problem,” (with Angelo Cacciuto, David R. Nelson and Alex Traveset): *Phys. Rev. Lett.* **89** (2002) 185502 [<http://arxiv.org/abs/cond-mat/0206144>].
99. “Grain Boundary Scars and Spherical Crystallography,” (with A. Bausch, A. Cacciuto, A. Dinsmore, M. Hsu, D. Nelson, M. Nikolaidis, A. Traveset and D. Weitz): *Science* **299** (2003) 1716 (arXiv:cond-mat/0303289).
100. “The Shapes of Dirichlet Defects,” (with Antonio De Felice and Mark Trodden): *JHEP* **10** (2003) 067 (arXiv:hep-th/0306224).
101. “Curvature-Induced Defect Unbinding in Toroidal Geometries,” (with David R. Nelson and Alex Traveset), *Phys. Rev.* **E69** (2004) 041102 (arXiv:cond-mat/0309709).
102. “Fixed-Connectivity Membranes”: Chapter 11 of *Statistical Mechanics of Membranes and Surfaces*; 2nd Edition (Edited by D. R. Nelson, T. Piran and S. Weinberg), World Scientific (Singapore, 2004) (arXiv:cond-mat/0412581).
103. “Direct Visualization of Dislocation Dynamics in Grain Boundary Scars,” (with Peter Lipowsky, Andreas Bausch, Jan Meinke and David R. Nelson), *Nature Mater.* **4** (2005) 407-411 (arXiv:cond-mat/0506366).
104. “Grain Boundary Scars on Spherical Crystals,” (with T. Einert, P. Lipowsky, J. Schilling and A.R. Bausch): *Langmuir* **21** (2005) 12076-12079 [<http://arxiv.org/abs/cond-mat/0506741>] (DOI: 10.1021/la0517383).
105. “Crystalline Particle Packings on a Sphere with Long Range Power Law Potentials,” (with Alex Traveset, Angelo Cacciuto and David Nelson), *Phys. Rev.* **B73** (2006) 024115 (arXiv:cond-mat/0509777).

106. “Paraboloidal Crystals,” (with Luca Giomi): *Chaos* **17** (2007) 041104 [DOI: 10.1063/1.2776670] (arXiv:1004.0706).
107. “Dynamics and Instabilities of Defects in Two-Dimensional Crystals on Curved Backgrounds,” (with Homin Shin and Alex Travasset), *Phys. Rev.* **E75** (2007) 021404 (arXiv:cond-mat/0610819).
108. “Crystalline Order On Riemannian Manifolds with Variable Gaussian Curvature and Boundary,” (with Luca Giomi), *Phys. Rev.* **B76** (2007) 054106 (arXiv:cond-mat/0702471).
109. “Vacancy localization in the square dimer model,” (with J. Bouttier, E. Gutter and M. Jeng), *Phys. Rev.* **E76** (2007) 041140 (arXiv:cond-mat/0706.1016).
110. “Interstitial Fractionalization and Spherical Crystallography,” (with H. Shin and D.R. Nelson) in “Colloidal Particles at Liquid Interfaces Themed Issue,” *Phys. Chem. Chem. Phys.* **9** (2007) 6304: DOI:10.1039/b710773k (arXiv:0707.1909).
111. “Bubble Raft Model for a Paraboloidal Crystal,” (with Luca Giomi, Homin Shin and Creighton K. Thomas), *Phys. Rev.* **E77** (2008) 021602 (arXiv:0709.2731).
112. “Topological Defects in Spherical Nematics,” (with Homin Shin and Xiangjun Xing), *Phys. Rev. Lett.* **101** (2008) 037802 (arXiv:0712.4012).
113. “Vacancy diffusion in the triangular lattice dimer model,” (with M. Jeng, W. Krauth, J. Schwarz and X. Xing), *Phys. Rev.* **E78** (2008) 021112 (arXiv:0801.471).
114. “Toroidal Crystals,” (with L. Giomi), *Phys. Rev.* **E 78**, 010601(R) (2008) (arXiv:0801.3484).
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