

*Curriculum Vitae***Margaret E. Carrington****PERSONAL DATA:**

Full Name: Margaret Elise Carrington  
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## EDUCATION:

**Ph.D.** in Nuclear Physics (theoretical) from State University of New York at Stony Brook, USA, May 1989.  
Thesis advisor: Professor T.H. Hansson.

**M.A.** in Physics from State University of New York at Stony Brook, USA, May 1987.

**A.B.** in Physics, minor in Mathematics (magna cum laude, with honours) from Bryn Mawr College, Bryn Mawr, Pennsylvania, USA, May 1983.

## SCHOLARSHIPS, AWARDS AND GRANTS:

2007: NSERC Research Grant; \$45,000 per year, for five years

2003: CFI Grant: \$267,000

2003: Canada Research Chair (Tier 2)

2002: NSERC Research Grant; \$35,000 per year, for five years

1998: NSERC Research Grant; \$30,030 per year, for four years

1998: NSERC Women's Faculty Award renewed for an additional two years

1997-1999: NATO Collaborative Grant with M. Burgess and G. Kunstatter; 225,00 BF [On Sept 15th, 1998  
1BF = 0.04551 CDN\$]

1996: Recommendation for Exceptional Merit; University of Winnipeg Faculty Association

1995-1997: NATO Collaborative Grant with M. Burgess and G. Kunstatter; 225,00 BF [On Sept 15th, 1998  
1BF = 0.04551 CDN\$]

1995: Alexander von Humboldt Fellowship; 42,000 DM [On Sept 15, 1998 1DM = 0.9182 CDN\$]

1994: NSERC Research Grant; \$20,500 per year, for three years

1994: NSERC Women's Faculty Award

1994 - University of Winnipeg start-up Grant, \$10,000

1983 - General Electric Fellowship from Bryn Mawr College, \$8,000

Entry in "*Who's Who of Canadian Women*".

## EMPLOYMENT:

Professor, Brandon University, Brandon Manitoba, March 2004 - present.

Associate Professor, Brandon University, Brandon, Manitoba, March 2000 - March 2004.

Assistant Professor, Brandon University, Brandon, Manitoba, September 1997 - March 2000.

Associate Professor (NSERC Women's University Faculty Award), University of Winnipeg, July 1997 - September 1997.

Assistant Professor (NSERC Women's University Faculty Award), University of Winnipeg, July 1994 - July 1997.

Instructor, Physics Department, University of Winnipeg, Sept. 1993 - April 1994.

Postdoctoral Fellow, Physics Department, University of Winnipeg, Sept. 1992 - June 1994.

Postdoctoral Fellow, Theoretical Physics Institute, University of Minnesota, Sept. 1989 - Sept. 1992.

Visiting Scientist, Department of Theoretical Physics, Oxford University, Oxford, England, June 1987 - Aug. 1987.

Research Assistant, Nuclear Theory Group, SUNY at Stony Brook, Sept. 1985 - May 1987 and Sept. 1987 - May 1989.

Research Assistant, Eidgenossische Institute für Reaktorforshung, Switzerland, June 1985 - Aug. 1985.

Teaching Assistant in the Physics Department., State University of New York at Stony Brook Sept. 1984 - May 1985.

## LIST OF PUBLICATIONS:

- *Journal Articles*

1. “*Leading Order QED Electrical Conductivity using the 3PI Effective Action*,” M. E. Carrington and E. Kovalchuk - arXiv:0709.0706
2. “*QED Electrical Conductivity using the 2PI Effective Action*,” M. E. Carrington and E. Kovalchuk, Phys. Rev. **D76**, 045019 (2007) - arXiv:0705.0162.
3. “*Index Summation in Real Time Statistical Field Theory*,” M. E. Carrington, T. Fugleberg, D. S. Irvine and D. Pickering, Eur. Phys. J. **C50** 711 (2007) - arXiv:hep-ph/0608298.
4. “*The Soft Fermion Dispersion Relation at Next-to-Leading Order in Hot QED*,” M. E. Carrington; Phys. Rev. **D75**, 045019 (2007) - arXiv:hep-ph/0610372 .
5. “*The Dynamics of Entanglement in the Adiabatic Search and Deutsch Algorithms*,” K. Choy, G. Passante, D. Ahrensmeier, M.E. Carrington, T. Fugleberg, R. Kobes and G. Kunstatter - arXiv:quant-ph/0605040 (accepted for publication in the Canadian Journal of Physics).
6. “*Energy Flow in Acoustic Black Holes*,” K Choy, T Kruk, M.E. Carrington, T. Fugleberg, J. Zahn, R. Kobes, G. Kunstatter and D. Pickering, Phys. Rev. **D73**, 104011 (2006) - arXiv:gr-qc/0505163 .
7. “*Transport Theory Beyond Binary Collisions*,” M.E. Carrington, S. Mrowczynski, Phys. Rev. **D71**, 065007 (2005) - arXiv:hep-ph/0406097 .
8. “*2PI Effective Action and Gauge Invariance Problems*,” M.E. Carrington, G. Kunstatter and H. Zaraket, Eur. Phys. J. **C42**, 253 (2005).
9. “*The 4PI Effective Action for  $\phi^4$  Theory*,” M.E. Carrington, Eur. Phys. J. **C35**, 383 (2004) - arXiv:hep-ph/0401123.
10. “*Dielectric Functions and Dispersion Relations of Ultra-Relativistic Plasmas with Collisions*,” M.E. Carrington, T. Fugleberg, D. Pickering and M.H. Thoma, Can. J. Phys. **82**, 671 (2004) - arXiv:hep-ph/0312103 .
11. “*Dileptons from Hot, Heavy, Static Photons*,” P. Aurenche, M.E. Carrington and N. Marchal, Phys. Rev. **D68**, 056001 (2003) - arXiv:hep-ph/0305226.
12. “*Scattering Amplitudes at Finite Temperature*,” M.E. Carrington, Hou Defu and R. Kobes, Phys. Rev. **D67**, 025021 (2003) - arXiv:hep-ph/0207115 .
13. “*Infrared behaviour of the pressure in  $g\phi^3$  theory in 6 dimensions*,” M.E. Carrington, T.J. Hammond and R. Kobes, Phys. Rev. **D65**, 067703 (2002) - arXiv:hep-ph/0111293.
14. “*Equilibration in an Interacting Field Theory*,” M.E. Carrington, R. Kobes, G. Kunstatter, D. Pickering and E. Vaz, Can. J. Phys. **80**, 987 (2002) - arXiv:hep-ph/0103098.
15. “*A General expression for Symmetry Factors of Feynman Diagrams*,” C.D Palmer and M.E. Carrington, Can. J. Phys. **80**, 847 (2002) - arXiv:hep-th/0108088.
16. “*Covariant approach to equilibration in effective field theories*,” Mark Burgess, M.E. Carrington and G. Kunstatter, Can. J. Phys. **80**, 97 (2002) - arXiv:hep-ph/0103188.
17. “*A Diagrammatic Interpretation of the Boltzmann Equation*,” M.E. Carrington, Hou Defu, R. Kobes, Phys. Lett. **B523**, 221 (2001) - arXiv:hep-ph/0106292.
18. “*Nonlinear Response from Transport Theory and Quantum Field Theory at Finite Temperature*,” M.E. Carrington, Hou Defu, R. Kobes, Phys. Rev. **D64**, 025001 (2001) - arXiv:hep-ph/0102256.
19. “*Spontaneous Symmetry Breaking for Scalar QED with Nonminimal Chern-Simons Coupling*,” D.S. Irvine, M.E. Carrington, G. Kunstatter and D. Pickering, Phys. Rev. **64**, 045015 (2001) - arXiv:hep-ph/0104209.
20. “*Spontaneous Scale Symmetry Breaking in 2+1 Dimensional QED at Both Zero and Finite Temperature*,” M.E. Carrington, WF Chen and R. Kobes, Eur. Phys. J **C18**, 757 (2001) - arXiv:hep-ph/0004199.

21. “*Approach to Equilibrium in the Micromaser*,” D. Leary, S. Yau, M.E. Carrington, R. Kobes and G. Kunstatter, *Can. J. Phys.* **79**, 783 (2001) - arXiv:physics/9907010.
22. “*KMS conditions for 4-point green functions at finite temperature*,” M.E. Carrington, Hou Defu and J.C. Sowiak, *Phys. Rev.* **D62**, 065003 (2000) - arXiv:hep-ph/0008282.
23. “*Shear Viscosity in  $\phi^4$  Theory from an Extended Ladder Resummation*,” M.E. Carrington, Hou Defu and R. Kobes, *Phys. Rev.* **D62**, 085013 (2000) - arXiv:hep-ph/9910344.
24. “*Four-Point Spectral Functions and Ward Identities in Hot QED*,” Hou Defu, M.E. Carrington, R. Kobes and U. Heinz, *Phys. Rev.* **D61**, 085013 (2000) - arXiv:hep-ph/9911494.
25. “*A New Formulation of a 1+1 Dimensional Field Theory Constrained to a Box*,” M.E. Carrington, R. Kobes and G. Kunstatter, *Phys. Rev.* **D61**, 125008 (2000) - arXiv:hep-th/9906202.
26. “*Evaluating Real Time Finite Temperature Feynman Amplitudes*,” M.E. Carrington, Hou Defu, A. Hachkowski, D. Pickering and J.C. Sowiak, *Phys. Rev.* **D61**, 25011 (2000) - arXiv:hep-ph/9908438.
27. “*Two-Loop Quantum Corrections of Scalar QED with non-Minimal Chern-Simons Coupling*,” M.E. Carrington, W.F. Chen, G. Kunstatter and J. Mottershead, *Phys. Rev.* **D60**, 125018 (1999) - arXiv:hep-th/9905172.
28. “*Equilibrium and Non-Equilibrium Hard Thermal Loop Resummation in the Real Time Formalism*,” M.E. Carrington, Hou Defu and Markus Thoma, *Eur. Phys. J.* **C7**, 347 (1999) - arXiv:hep-ph/9708363.
29. “*Ward Identities in Non-Equilibrium QED*,” M.E. Carrington, Hou Defu and Markus Thoma, *Phys. Rev.* **D58**, 085025 (1998) - arXiv:hep-th/9801103.
30. “*The General Cancellation of Ladder Graphs at Finite Temperature*,” M.E. Carrington and R. Kobes, *Phys. Rev.* **D57**, 6372 (1998) - arXiv:hep-ph/9712280.
31. “*Cancellation of Ladder Graphs in an Effective Expansion*,” M.E. Carrington, R. Kobes and E. Petitgirard, *Phys. Rev.* **D57**, 2631 (1998) - arXiv:hep-ph/9708412.
32. “*The Effective Action For a Relativistic Jaynes-Cummings Model*,” M. Burgess, M.E. Carrington and G. Kunstatter, *Can. J. Phys.* **76**, 1 (1998) - arXiv:quant-ph/9703015.
33. “*Three Point Functions at Finite Temperature*,” M.E. Carrington and U. Heinz, *Eur. Phys. J.* **C1**, 619 (1998) - arXiv:hep-th/9606055.
34. “*The Bosonization of Theories with Pseudo-vector Interactions*,” M.E. Carrington, *Z. Phys. C.* **72**, 531 (1996).
35. “*Boundaries and Junctions in Two Parity Violating Models in 2+1 Dimensions*,” M. Burgess and M.E. Carrington, *Phys. Rev.* **B52**, 5052 (1995) - arXiv:cond-mat/9408003.
36. “*The Meissner Effect in Scalar QED with Magnetic Moment Interactions*,” M.E. Carrington, *Phys. Rev.* **D51**, 4451 (1995).
37. “*Maxwell-Chern-Simons Scalar QED with Magnetic Moment Interactions*,” M.E. Carrington and G. Kunstatter, *Phys. Rev.* **D51**, 1903 (1995).
38. “*Massless Scalar QED with Non-Minimal Chern-Simons Coupling*,” M.E. Carrington and G. Kunstatter, *Phys. Rev.* **D50**, 2830 (1994) - hep-ph/9403375.
39. “*Phase Transitions in Massless Scalar QED with non-minimally coupled Chern-Simons Term*,” M.E. Carrington and G. Kunstatter, *Phys. Lett.* **B321**, 223 (1994).
40. “*Self-Consistent Resummation Scheme in Scalar QED*,” M.E. Carrington *Phys. Rev.* **D48**, 3836 (1993).
41. “*Dynamics of the Electroweak Phase Transition*,” M.E. Carrington and J.I. Kapusta, *Phys. Rev.* **D47**, 5304 (1993).
42. “*The Effective Potential at Finite Temperature in the Standard Model*,” M.E. Carrington, *Phys. Rev.* **D45**, 2933 (1992).
43. “*Superconducting Phase Transition in a 2D Chern-Simons Theory*,” J. Kapusta, M.E. Carrington, B. Bayman, D.Seibert and C.S. Song, *Phys. Rev.* **B44**, 7519 (1991).

44. “*Linear Response of Hot Gluons,*” M.E. Carrington, T.H.Hansson, H.Yamagishi, and I. Zahed, *Annals of Physics*, **190**, 373 (1989).
45. “*The Time-Like Axial Gauge at Zero and Finite Temperature,*” M.E. Carrington, H. Yamagishi and I. Zahed, Stony Brook Technical Report 88-0556, (1988).
46. “*Hydrodynamic Flow Structures and the QCD Plasma,*” M.E. Carrington, M.J. Rhoades-Brown, and M. Ploszajczak, *Phys. Rev.* **D35**, 3981 (1987).
47. “*A General NMR Spectral Density and Its Experimental Verification,*” A.M. Albano, P.A. Beckmann, M.E. Carrington, F.A. Fusco, A.E. O’Neill and M.E. Scott, *J. Phys. C: Solid State Phys.*, **16**, L979 (1983).
48. “*Phonon Peaks in the Dynamic Structure Function of a Two Dimensional Harmonic Crystal,*” F. Weling, A. Griffin and M. Carrington, *Phys. Rev.* **B28**, 5296 (1983).

• *Papers in Refereed Proceedings*

49. “*Gauge Invariance of the static fermion mass beying hard thermal loops ,*” M.E. Carrington and E. Mottola, *Proceedings of the 7th International Conference on Strong and Electroweak Matter 2006 - SEWM 2006*, *Nuc. Phy.* **A785**, 142 (2007).
50. “*Statistical Field Theory,*” T. Fugleberg and M.E. Carrington, *Proceedings of Theory Canada II*, to be published in *Canadian Journal of Physics*.
51. “*Contributions to Transport Theory from Multi-Particle Interactions and Production Processes*”, M.E. Carrington, refereed paper published electronically in the proceedings of the SEWM 2004 Meeting, June 16 - 19th, 2004, Helsinki, Finland.
52. “*Chapman-Enskog Expansion of the Boltzmann equation and its Diagrammatic Interpretation*”, M.E. Carrington, Hou Defu, R. Kobes, refereed paper published electronically in the proceedings of the XXXI International Symposium of Multiparticle Dynamics, Sept 1-7, 2001, Datong, China - arXiv:hep-ph/0111446.
53. “*Non-Equilibrium HTL Resummation*”, M.E. Carrington, Hou Defu, M.H. Thoma, refereed paper published electronically in the proceedings at the 5th International Workshop on ‘Thermal Fields and their Applications,’ August 10-14, 1998, Regensburg, Germany - arXiv:hep-ph/9808359.
54. “*Phase Transitions in Non-Minimally Coupled Chern-Simons Scalar QED,*” M.E. Carrington and G. Kunstatter, Banff CAP Workshop on Thermal Field Theory (editors: Khanna, Kobes, Kunstatter and Umezawa), World Scientific (Singapore, 1994).
55. “*Ring Diagram Summations in the Finite Temperature Effective Potential,*” M.E. Carrington, *Can. Jnl. of Phys.* **71**, 227 (1993), (Proceedings of the Workshop on Perturbative Methods in Hot Gauge Theories, editors: R. Kobes and G. Kunstatter).
56. “*A General Approximation Scheme for Quantum Many Body Dynamics,*” M. Ploszajczak, M.J. Rhoades-Brown and M.E. Carrington, *Proceedings, The Physics of Phase Space*, 279 (1986).