

Publications

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1. Height estimates for exterior problems of capillarity-type, *Pacific Journal of Mathematics* **88**, 517-540, 1980.
2. Asymptotic estimates for an axisymmetric rotating fluid (with A. Friedman), *Journal of Functional Analysis* **37**, 136-163, 1980.
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4. Existence and dimensions of a rotating white dwarf (with A. Friedman), *Journal of Differential Equations* **42**, 414-437, 1981.
5. Vortex rings: existence and asymptotic estimates (with A. Friedman), *Transactions of the American Mathematical Society* **268**, 1-37, 1981.
6. On steady vortex flow in two dimensions, I, *Communications in Partial Differential Equations* **8(9)**, 999-1030, 1983.
7. On steady vortex flow in two dimensions, II, *Communications in Partial Differential Equations* **8(9)**, 1031-1071, 1983.
8. Steady flow with vorticity, in *Free-boundary problems: theory and applications, vol. 1*, A. Fasano and M. Primicerio, editors, Pitman, 48-51, 1983.
9. Corotating steady vortex flows with N-fold symmetry, *Journal of Nonlinear Analysis: Theory, Methods and Applications* **9(4)**, 351-369, 1985.
10. On the evolution of a concentrated vortex in an ideal fluid, *Archive for Rational Mechanics and Analysis* **97**, 75-87, 1987.
11. Nonlinear steady waves in planetary vortex dynamics, *Indiana University Mathematics Journal* **36**, 811-841, 1987.
12. On the computation of nonlinear planetary waves (with A. Eydeland), *Studies in Applied Mathematics* **76**, 37-67, 1987.
13. A computational methods of solving free boundary problems in vortex dynamics (with A. Eydeland), *Journal of Computational Physics* **78**, 194-214, 1988.
14. An iterative method for computing steady vortex flow systems (with A. Eydeland), in *Mathematical Aspects of Vortex Dynamics*, R. Caflisch, editor, SIAM (Philadelphia) 80-87, 1988.

15. A variational approach to computing plasma equilibria (with A. Eydeland and J. Spruck), in *Proceeding of Workshop on MHD Computations and Torus Confinement Plasmas*, Seiunso in Hakone, Japan, 1988.
16. Vortex rings with swirl: Axisymmetric solutions of the Euler equations with nonzero helicity, *SIAM Journal of Mathematical Analysis* **20**, 57-73, 1989.
17. Computational method for multiconstrained variational problems arising in equilibrium magnetohydrodynamics (with A. Eydeland and J. Spruck), *Proceeding of the Fifth International Symposium on Numerical Methods in Engineering*, Vol. 2, R. Gruber, J. Periaux and R. P. Shaw, eds., Springer-Verlag (Berlin), 1989.
18. Two approaches to computing solutions of stationary problems in fluid dynamics and magnetohydrodynamics (with A. Eydeland), in *Mathematical Analysis of Fluid and Plasma Dynamics*, RIMS Kokyuroku 734, Kyoto University, 1-7, 1990.
19. Multiconstrained variational problems of nonlinear eigenvalue type: new formulations and algorithms (with A. Eydeland and J. Spruck), *Mathematics of Computation* **55**, 509-535, 1990.
20. Numerical test of 3-D vortex methods using a vortex ring with swirl (with J. T. Beale and A. Eydeland), in *Vortex Dynamics and Vortex Methods*, Lectures in Appl. Math. (A.M.S.) **28**, 1-10, 1991.
21. Multiconstrained variational problems in magnetohydrodynamics: equilibrium and slow evolution (with A. Eydeland, A. Lifschitz and J. Spruck), *Journal of Computational Physics* **106**, 269-285, 1993.
22. Maximum entropy states for rotating vortex patches, (with N. Whitaker), *Phys. Fluids A* **6(12)**, 3963-3973, 1994.
23. Turbulent relaxation of a magnetofluid: a statistical equilibrium model, (with R. Jordan), in *Advances in Geometric Analysis and Continuum Mechanics*, International Press (Boston), 124-138, 1995.
24. Maximum entropy states and coherent structures in magnetohydrodynamics (with R. Jordan), in *Maximum Entropy and Bayesian Methods*, K.M. Hanson and R.N. Silver, eds., 347-353, Kluwer Academic Publishers (the Netherlands), 1996.
25. Statistical equilibrium computations of coherent structures in a turbulent shear layer (with N. Whitaker), *SIAM Journal of Scientific Computing* **17(6)**, 1414-1433, 1996.
26. Ideal magnetofluid turbulence in two dimensions (with R. Jordan), *Journal of Statistical Physics* **87(3/4)**, 661-695, 1997.
27. Statistical mechanics of organized structures in two-dimensional magnetofluid turbulence (with R. Jordan), *Nonlinear Analysis: Theory, Methods, and Applications* **30**, 3629-3636, 1997.
28. Prototype geophysical vortex structures via large-scale statistical theory (with M. DiBattista and A. Majda), *Geophysical and Astrophysical Fluid Dynamics* **89**, 235-283, 1998.

29. Statistical equilibrium measures and coherent states in two-dimensional turbulence, *Communications in Pure and Applied Mathematics* **52**, 781-809, 1999.
30. Spatializing random measures: doubly-indexed processes and the large deviation principle (with C. Boucher and R.S. Ellis), *Annals of Probability* **27**, 297-324, 1999.
31. Derivation of maximum entropy principles in two-dimensional turbulence via large deviations (with C. Boucher and R.S. Ellis), *Journal of Statistical Physics* **98**, 1235-1278, 2000.
32. A mean-field statistical theory for the nonlinear Schrödinger equation (with R. Jordan and C. Zirbel), *Physica D* **137**, 353-378, 2000.
33. Large deviation principles and complete equivalence and nonequivalence results for pure and mixed ensembles (with R.S. Ellis and K. Haven), *Journal of Statistical Physics* **101**, 999-1064, 2000.
34. Statistical equilibrium theories for the nonlinear Schrödinger equation (with R. Jordan), *Proceedings of the AMS-IMS-SIAM Joint Summer Research Conference on Dispersive Wave Turbulence, June 2000*, P.A. Milewski et al., eds. *Contemporary Mathematics* **283**, 27-39, A.M.S., 2001.
35. A statistical equilibrium model of zonal shears and embedded vortices in a Jovian atmosphere. *Proceedings of the IUTAM Symposium on Advances in Mathematical Modeling of Atmosphere and Ocean Dynamics, Limerick, Ireland, July 2000*, P.F. Hodnett, ed., pp. 271-278, Kluwer, 2001.
36. Statistical equilibrium predictions of jets and spots on Jupiter (with A. Majda, K. Haven and M. DiBattista), *Proceedings of the National Academy of Sciences U.S.A.* **98**, 12346-12350, 2001.
37. Nonequivalent statistical equilibrium ensembles and refined stability theorems for most probable flows (with R.S. Ellis and K. Haven), *Nonlinearity* **15**, 239-255, 2002.
38. Analysis of statistical equilibrium models of geostrophic turbulence (with R. S. Ellis and K. Haven), *Journal of Applied Mathematics and Stochastic Analysis*, **15**, 341-361, 2002.
39. A statistical approach to the asymptotic behavior of a class of generalized nonlinear Schrödinger equations (with R. S. Ellis and R. Jordan), *Communications in Mathematical Physics* **244**, 187-208, 2004.
40. Thermodynamic versus statistical nonequivalence of ensembles for the mean-field Blume-Emery-Griffiths model (with R.S. Ellis and H. Touchette), *Physica A* **335**, 518-538, 2004.
41. An introduction to the thermodynamic and macrostate levels of nonequivalent ensembles (with H. Touchette and R.S. Ellis), *Physica A* **340**, 138-146, 2004.
42. The generalized canonical ensemble and its universal equivalence with the microcanonical ensemble (with R.S. Ellis, H. Touchette and M. Costeniuc), *Journal of Statistical Physics* **119**, 1283-1329, 2005.

43. Nonequilibrium statistical behavior of nonlinear Schrödinger equations (with A. Eisner). *Physica D* **213**, 85-97, 2006.
44. Metastability within the generalized canonical ensemble (with H. Touchette, M. Costeniuc and R.S. Ellis). *Physica A* **365**, 132-137, 2006.
45. Generalized canonical ensembles and ensemble equivalence (with M. Costeniuc, R.S. Ellis and H. Touchette). *Phys. Rev. E* **E**, 026105, 2006.
46. Generalized canonical ensembles and ensemble equivalence (with M. Costeniuc, R.S. Ellis and H. Touchette). *Phys. Rev. E*, 026105, 2006.
47. Minimax variational principle for steady balanced solutions of the rotating shallow water equations (with V. Nageswaran). *Comm. Math. Sci.* **8(2)**: 321–339, 2009.
48. Statistical mechanics of two-dimensional and quasi-geostrophic flows. In *Long-Range Interacting Systems*, Lecture Notes of the 2008 Les Houches Summer School, vol. 90, pp. 159–209, S. Ruffo, L. F. Cugliandolo and Thierry Dauxois, editors. Oxford University Press, 2010.
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50. An optimization principle for deriving nonequilibrium statistical models of Hamiltonian dynamics. *Journal of Statistical Physics* **152**, 569-597, 2013.
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52. Coarse-graining two-dimensional turbulence via dynamical optimization (with Q.-Y. Chen and S. Thalabard). *Nonlinearity*, **29**, 2961-2989, 2016.
53. Optimal thermalization in a shell model of homogeneous turbulence (with S. Thalabard). *Journal of Physics A: Mathematical and Theoretical*, **49**, 165502, 2016.
54. Optimal response to non-equilibrium disturbances under truncated Burgers-Hopf dynamics. (with S. Thalabard), *Journal of Physics A: Mathematical and Theoretical*, **50**, 175502, 2017.