

PUBLICATIONS OF MITCHELL LUSKIN

References

- [1] An approximation procedure for nonsymmetric, nonlinear hyperbolic systems with nonlinear boundary conditions. *SIAM J. Numer. Anal.*, 16:145–164, 1979.
- [2] A Galerkin method for nonlinear parabolic equations with nonlinear boundary conditions. *Math. Comput.*, 33:493–519, 1979.
- [3] Convergence of a finite element method for the approximation of normal modes of the oceans. *Math. Comput.*, 33:493–519, 1979.
- [4] Numerical analysis of weak random drift in a cline (with T. Nagylaki). *Genetics*, 92:297–303, 1979.
- [5] A finite element method for first order hyperbolic systems. *Math. Comput.*, 35:1093–1112, 1980.
- [6] Approximation of the spectrum of closed operators: the determination of normal modes of a rotating basin (with J. Descloux and J. Rappaz). *Math. Comput.*, 36:137–154, 1981.
- [7] On the smoothing property of the Galerkin method for parabolic equations (with R. Rannacher). *SIAM J. Numer. Anal.*, 19:93–113, 1981.
- [8] On the existence of global smooth solutions for a model equation for fluid flow in a pipe. *J. Math. Anal. Appl.*, 84:614–630, 1981.
- [9] An adaptive time discretization procedure for parabolic problems (with I. Babuška). In *Proceedings of the Fourth IMACS International Symposium on Computer Methods for Partial Differential Equations*, 1981.
- [10] Stability and error bounds for a fractional step scheme to compute weak solutions of the nonlinear waterhammer problem (with B. Temple). In *Lectures on the Numerical Solution of Partial Differential Equations*, volume 20, pages 270–289. Department of Mathematics, University of Maryland, 1981.
- [11] The existence of a global weak solution to the nonlinear waterhammer problem (with B. Temple). *Comm. Pure Appl. Math.*, 35:697–735, 1982.
- [12] On a finite element method to solve the criticality eigenvalue problem for the transport equation (with J. Descloux). *SIAM J. Numer. Anal.*, 19:1208–1218, 1982.
- [13] On the smoothing property of the Crank-Nicolson scheme (with R. Rannacher). *Applicable Analysis*, 14:117–135, 1982.
- [14] On the variable sign penalty approximation of the Navier-Stokes equation (with H. Khesghi). In Joel Smoller, editor, *Nonlinear Partial Differential Equations*, volume 17 of *Contemporary Mathematics*, Providence, 1983. American Mathematical Society.
- [15] Improved flux calculations for viscous incompressible flow by the variable penalty method (with H. Khesghi). In *Lectures in Applied Mathematics*, volume 22, Providence, 1984. American Mathematical Society.
- [16] On the classification of the equations of viscoelasticity. *Journal of Non-Newtonian Fluid Mechanics*, 16:3–11, 1984.
- [17] Analysis of the finite element variable penalty method for Stokes equation (with H. Khesghi). *Math. Comput.*, 45:347–363, 1985.
- [18] Analysis of a block Gauss-Seidel iterative method for a finite element discretization of the neutron transport equation (with L. Lorence and W. Martin). *Transport Theory and Statistical Physics*, 144:35–62, 1985.

- [19] Elastohydrodynamical problems in magnetic recording (with M. Chipot, S. Kistler, and D. Perry). In *Proceedings of the Congrès National d'Analyse Numérique*, pages 209–212, France, 1985.
- [20] Existence and uniqueness of solutions to the compressible Reynolds lubrication equation (with M. Chipot). *SIAM Journal on Math. Analysis*, 17:1390–1399, 1986.
- [21] The compressible Reynolds lubrication equation (with M. Chipot). In S. Antman, J. Ericksen, D. Kinderlehrer, and I. Muller, editors, *Metastability and Incompletely Posed Problems*, volume 3 of *IMA Volumes in Mathematics and its Applications*, pages 61–76, New York, 1987. Springer-Verlag.
- [22] Minimum energy configurations for liquid crystals (with R. Cohen, R. Hardt, D. Kinderlehrer, and S.-Y. Lin). In J. Ericksen and D. Kinderlehrer, editors, *Theory and Applications of Liquid Crystals*, volume 5 of *IMA Volumes in Mathematics and its Applications*, pages 99–121, New York, 1987. Springer-Verlag.
- [23] Remarks about the mathematical theory of liquid crystals (with R. Hardt and D. Kinderlehrer). In S. Hildebrandt, D. Kinderlehrer, and M. Miranda, editors, *Calculus of Variations and Partial Differential Equations*, volume 1340 of *Lecture Notes in Mathematics*, pages 123–138, New York, 1988. Springer-Verlag.
- [24] Relaxation methods for liquid crystal problems (with S.-Y. Lin). *SIAM J. Numer. Anal.*, 26:1310–1324, 1989.
- [25] The computation of the austenitic-martensitic phase transition (with C. Collins). In *Partial Differential Equations and Continuum Models of Phase Transitions*, volume 344 of *Lecture Notes in Physics*, pages 34–50, New York, 1989. Springer-Verlag.
- [26] Computational results for phase transitions in shape memory materials (with C. Collins). In C. Rogers, editor, *Smart Materials, Structures, and Mathematical Issues*, pages 198–215, Lancaster, Pennsylvania, 1989. Technomic Publishing Co.
- [27] Approximation theories for inertial manifolds (with G. Sell). *Mathematical Modelling and Numerical Analysis*, 23:445–461, 1989.
- [28] Relaxation and gradient methods for molecular orientation in liquid crystals (with R. Cohen and S.-Y. Lin). *Computer Physics Communications*, 53:455–465, 1989.
- [29] Existence of solutions to the elastohydrodynamical equations for magnetic recording systems (with M. Chipot). *SIAM Journal on Math Analysis*, 21:1–17, 1990.
- [30] Numerical modeling of the microstructure of crystals with symmetry-related variants (with C. Collins). In I. Ahmad, A. Crowson, C. Rogers, and M. Aizawa, editors, *Proceedings of the US - Japan Workshop on Smart/Intelligent Materials and Systems*, pages 309–318, Lancaster, Pennsylvania, 1990. Technomic Publishing Co.
- [31] Construction of inertial manifolds by elliptic regularization (with E. Fabes and G. Sell). *Journal of Differential Equations*, 89:355–387, 1991.
- [32] Numerical approximation of the solution of a variational problem with a double well potential (with C. Collins and D. Kinderlehrer). *SIAM J. Numer. Anal.*, 28:321–332, 1991.
- [33] Optimal order error estimates for the finite element approximation of the solution of a nonconvex variational problem (with C. Collins). *Math. Comp.*, 57:621–637, 1991.
- [34] Numerical analysis of microstructure for crystals with a nonconvex energy density. In Michel Chipot and J. Saint Jean Paulin, editors, *Progress in Partial Differential Equations: the Metz Surveys*, volume 249 of *Pitman Research Notes in Mathematics Series*, pages 156–165, UK, 1991. Longman House.
- [35] Field-induced instabilities in nematic liquid crystals (with R. Cohen). In *Nematics: Mathematical and Physical Aspects*, volume 332 of *Nato ASI Series, Series C: Mathematical and Physical Sciences*, pages 261–278, Dordrecht, Netherlands, 1991. Kluwer Academic Publishers.

- [36] Computational images of crystalline microstructure (with C. Collins and J. Riordan). In J. Taylor, editor, *AMS Special Lectures in Mathematics and AMS Videotape Library*, pages 16–18, Providence, 1991. Amer. Math. Soc.
- [37] Shear flow instabilities in liquid crystals (with T.-W. Pan). In R. Vichnevetsky and J.J.H. Miller, editors, *Proceedings of the 13th IMACS World Congress on Computation and Applied Mathematics, Vol. 2*, pages 793–794, Trinity College, Dublin, Ireland, 1991.
- [38] Analysis of the finite element approximation of microstructure in micromagnetics (with L. Ma). *SIAM J. Numer. Anal.*, 29:320–331, 1992.
- [39] Nonplanar shear flows for nonaligning nematic liquid crystals (with T.-W. Pan). *Journal of Non-Newtonian Fluid Mechanics*, 42:369–384, 1992.
- [40] Computational results for martensitic twinning (with C. Collins). In Perkins and Wayman, editors, *Proceedings of the International Conference on Martensitic Transformations*, pages 83–88, Carmel, California, 1993. Monterey Institute of Advanced Studies.
- [41] Numerical optimization of the micromagnetics energy (with L. Ma). In *Mathematics in Smart Materials*, pages 19–29. SPIE, 1993.
- [42] Computational results for a two-dimensional model of crystalline microstructure (with C. Collins and J. Riordan). In J. Ericksen, R. James, D. Kinderlehrer, and M. Luskin, editors, *Microstructure and Phase Transitions*, pages 51–56, New York, 1993. Springer-Verlag. IMA Volumes in Mathematics and Its Applications, vol. 54.
- [43] The computation of the dynamics of martensitic microstructure (with P. Klouček). *Continuum Mech. Thermodyn.*, 6:209–240, 1994.
- [44] Computational modeling of the martensitic transformation with surface energy (with P. Klouček). *Mathematical and Computer Modelling*, 20:101–121, 1994.
- [45] Analysis of a class of nonconforming finite elements for crystalline microstructures (with P. Klouček and B. Li). *Math. Comput.*, 65:1111–1135, 1996.
- [46] On the computation of crystalline microstructure. *Acta Numerica*, 5:191–258, 1996.
- [47] Numerical analysis of a microstructure for a rotationally invariant, double well energy. *Zeitschrift für Angewandte Mathematik und Mechanik*, 76:405–408, 1996.
- [48] Approximation of a laminated microstructure for a rotationally invariant, double well energy density. *Numer. Math.*, 75:191–258, 1997.
- [49] Finite element analysis of microstructure for the cubic to tetragonal transformation (with B. Li). *SIAM J. Numer. Anal.*, 35:376–392, 1998.
- [50] Nonconforming finite element approximation of crystalline microstructure (with B. Li). *Math. Comp.*, 67:917–946, 1998.
- [51] The stability and numerical analysis of martensitic microstructure. In H. Bock, F. Brezzi, R. Glowinski, G. Kanschat, Y. Kuznetsov, J. Périaux, and R. Rannacher, editors, *ENUMATH 97*, pages 54–69, 1998.
- [52] Approximation of a laminate with varying volume fractions (with B. Li). *Mathematical Modelling and Numerical Analysis*, 33:67–87, 1999.
- [53] Theory and computation for the microstructure near the interface between twinned layers and a pure variant of martensite (with B. Li). *Materials Science & Engineering A*, 273:237–240, 1999.
- [54] The simply laminated microstructure in martensitic crystals that undergo a cubic to orthorhombic phase transformation (with K. Bhattacharya and B. Li). *Archive for Rational Mechanics and Analysis*, 149:123–154, 1999.
- [55] On the stability of microstructure for general martensitic transformations. In H.-J. Bungartz, R. W. Hoppe, and C. Zenger, editors, *Lectures on Applied Mathematics*, pages 31–44. Springer-Verlag, 2000.

- [56] Stability of microstructure for tetragonal to monoclinic martensitic transformations (with P. Bělík). *Mathematical Modelling and Numerical Analysis*, 34:663–685, 2000.
- [57] Post-processing of Galerkin methods for hyperbolic problems. (with B. Cockburn, C.-W. Shu, and E. Suli). In Bernardo Cockburn, G. E. Karniadakis, and Chi-Wang Shu, editors, *First International Symposium on Discontinuous Galerkin Methods*, volume 33 of *Lecture Notes in Computational Science and Engineering*. Springer-Verlag, 2000.
- [58] Stability of microstructures for some martensitic transformations (with Y. Efendiev). *Mathematical and Computer Modelling*, 34:1289–1305, 2000.
- [59] A model for kinetically controlled internal phase segregation during aerosol coagulation (with Henning Struchtrup and Michael Zachariah). *J. Aerosol Science*, 32:1479–1504, 2001.
- [60] On the numerical modeling of deformations of pressurized martensitic thin films (with P. Bělík and T. Brule). *Mathematical Modelling and Numerical Analysis*, 35:525–548, 2001.
- [61] A total-variation surface energy model for thin films of martensitic crystals (with P. Bělík). *Interfaces and Free Boundaries*, 4:71–88, 2002.
- [62] A hybrid sectional-moment model for coagulation and phase segregation in binary liquid nanodroplets (with Yalchin Efendiev, Henning Struchtrup, and Michael Zachariah). *J. Nanoparticle Research*, 4:61–72, 2002.
- [63] A computational model for the indentation and phase transformation of a martensitic thin film (with P. Bělík). *Journal of the Mechanics and Physics of Solids*, 50:1789–1815, 2002.
- [64] Computational modeling of microstructure. In *Proceedings of the International Congress of Mathematicians, ICM 2002, Beijing*, volume III, pages 707–716, 2002.
- [65] Numerical methods for martensitic phase transformation and microstructure (with P. Bělík). In *Proceedings of the 20th Biennial Conference on Numerical Analysis*, D F Griffiths and G A Watson, editors, pages 13–16. University of Dundee, 2003.
- [66] Enhanced accuracy by post-processing for finite element methods for hyperbolic equations (with B. Cockburn, C.-W. Shu, and E. Suli). *Math. Comp.*, 72:577–606, 2003.
- [67] The computation of martensitic microstructure with piecewise laminates (with M. Kružík). *Journal of Scientific Computing*, 19:293–308, 2003.
- [68] Approximation by piecewise constant functions in a BV metric (with P. Bělík). *Mathematical Models & Methods in Applied Sciences*, 13:373–393, 2003.
- [69] A computational model for martensitic thin films with compositional fluctuation (with P. Bělík). *Mathematical Models & Methods in Applied Sciences*, 14:1585–1598, 2004.
- [70] Computational modeling of softening in a structural phase transformation (with P. Bělík). *SIAM J. Multiscale Modeling & Simulation*, 3:764–781, 2005.
- [71] Existence of energy minimizers for magnetostrictive materials (with P. Rybka). *SIAM J. Math. Anal.*, 36:2004–2019, 2005.
- [72] The Γ -convergence of a sharp interface thin film model with non-convex elastic energy (with P. Bělík). *SIAM J. Math. Anal.*, 38:414–433, 2006.
- [73] Computational modeling of ferromagnetic shape memory thin films (with Julia Liakhova and Tianyu Zhang). *Ferroelectrics*, 342:73–82, 2006.
- [74] A finite element model for martensitic thin films (with Pavel Bělík). *Calcolo*, 43:197–215, 2006.
- [75] Non-ergodicity of the Nosé-Hoover thermostatted harmonic oscillator (with Frédéric Legoll and Richard Moeckel). *Archive for Rational Mechanics and Analysis*, 184:449–463, 2007.

- [76] Numerical analysis of a model for ferromagnetic shape memory thin films (with Tianyu Zhang). *Computer Methods in Applied Mechanics and Engineering*, 196:3759–3770, 2007.
- [77] Goal-oriented atomistic-continuum adaptivity for the quasicontinuum approximation (with Marcel Arndt). *International Journal for Multiscale Computational Engineering*, 5:407–415, 2007.
- [78] A multilattice quasicontinuum for phase transforming materials: Cascading Cauchy Born kinematics (with Matthew Dobson, Ryan Elliott, and Ellad Tadmor). *Journal of Computer-Aided Materials Design*, 14:219–237, 2007.
- [79] Analysis of a force-based quasicontinuum approximation (with Matthew Dobson). *Mathematical Modelling and Numerical Analysis*, 42:113–139, 2008.
- [80] Error estimation and atomistic-continuum adaptivity for the quasicontinuum approximation of a Frenkel-Kontorova model (with Marcel Arndt). *SIAM J. Multiscale Modeling & Simulation*, 7:147–170, 2008.
- [81] Goal-oriented adaptive mesh refinement for the quasicontinuum approximation of a Frenkel-Kontorova model (with Marcel Arndt). *Computer Methods in Applied Mechanics and Engineering*, 197:4298–4306, 2008.
- [82] Iterative solution of the quasicontinuum equilibrium equations with continuation (with Matthew Dobson). *Journal of Scientific Computing*, 37:19–41, 2008.
- [83] An analysis of the effect of ghost force oscillation on quasicontinuum error (with Matthew Dobson). *Mathematical Modelling and Numerical Analysis*, 43:591–604, 2009.
- [84] Non-ergodicity of Nosé-Hoover dynamics (with Frédéric Legoll and Richard Moeckel). *Nonlinearity*, 22:1673–1694, 2009.
- [85] An optimal order error analysis of the one-dimensional quasicontinuum approximation (with Matthew Dobson). *SIAM J. Numer. Anal.*, 47:2455–2475, 2009.
- [86] An analysis of node-based cluster summation rules in the quasicontinuum method (with Christoph Ortner). *SIAM J. Numer. Anal.*, 47:3070–3086, 2009.
- [87] Stability, instability, and error of the force-based quasicontinuum approximation (with Matthew Dobson and Christoph Ortner). *Archive for Rational Mechanics and Analysis*, 197:179–202, 2010. arXiv:0903.0610.
- [88] Sharp stability estimates for force-based quasicontinuum methods (with Matthew Dobson and Christoph Ortner). *SIAM J. Multiscale Modeling & Simulation*, 8:782–802, 2010. arXiv:0907.3861.
- [89] Accuracy of quasicontinuum approximations near instabilities (with Matthew Dobson and Christoph Ortner). *Journal of the Mechanics and Physics of Solids*, 58:1741–1757, 2010. arXiv:0905.2914v2.
- [90] Iterative methods for the force-based quasicontinuum approximation (with Matthew Dobson and Christoph Ortner). Iterative methods for the force-based quasicontinuum approximation. *Computer Methods in Applied Mechanics and Engineering*, 200:2697–2709, 2011. arXiv:0910.2013v3.
- [91] Analysis of energy-based blended quasicontinuum approximations (with Brian Van Koten). Analysis of energy-based blended quasi-continuum approximations. *SIAM Journal on Numerical Analysis*, 49(5):2182–2209, 2011. arXiv:1008.2138.
- [92] Pavel Bělk and Mitchell Luskin. Analysis of the quasi-nonlocal approximation of linear and circular chains in the plane. *SIAM J. Multiscale Modeling & Simulation*, 9:1495–1527, 2011. arXiv:1008.3716.
- [93] Linear stationary iterative methods for the force-based quasicontinuum approximation (with Christoph Ortner). In Bjorn Engquist, Olof Runborg, and Richard Tsai, editors, *Numerical Analysis and Multiscale Computations*, volume 82 of *Lect. Notes Comput. Sci. Eng.*, pages 331–368. Springer Verlag, 2012. arXiv:1104.1774.
- [94] An analysis of the quasi-nonlocal quasicontinuum approximation of the embedded atom model (with Xingjie Helen Li). *International Journal for Multiscale Computational Engineering*, 10:33–49, 2012. arXiv:1008.3628v4.

- [95] A generalized quasi-nonlocal atomistic-to-continuum coupling method with finite range interaction (with Xingjie Helen Li). *IMA Journal of Numerical Analysis*, to appear. arXiv:1007.2336v2, doi: 10.1093/imanum/drq049.
- [96] A computational and theoretical investigation of the accuracy of quasicontinuum methods (with Brian Van Koten, Xingjie Helen Li, and Christoph Ortner). In Ivan Graham, Tom Hou, Omar Lakkis, and Rob Scheichl, editors, *Numerical Analysis of Multiscale Problems*, volume 82 of *Lect. Notes Comput. Sci. Eng.* Springer Verlag, 2012. arXiv:1012.6031.
- [97] Atomistic-to-continuum coupling (with Christoph Ortner). In Bjorn Engquist, editor, *Encyclopedia of Applied and Computational Mathematics*. Springer, 2013.

BOOKS EDITED BY MITCHELL LUSKIN**References**

- [1] *Computational Fluid Dynamics and Reacting Gas Flows* (with B. Engquist and A. Majda), volume 12 of *IMA Volumes in Mathematics and Its Applications*. Springer-Verlag, New York, 1988.
- [2] *Microstructure and Phase Transitions* (with J. Ericksen, R. James, and D. Kinderlehrer), volume 54 of *IMA Volumes in Mathematics and Its Applications*. Springer-Verlag, New York, 1993.
- [3] *Recent Advances in Iterative Methods* (with G. Golub and A. Greenbaum), volume 60 of *IMA Volumes in Mathematics and Its Applications*. Springer-Verlag, New York, 1994.
- [4] *Grid Generation and Adaptive Algorithms* (with M. Bern and J. Flaherty), volume 113 of *IMA Volumes in Mathematics and Its Applications*. Springer-Verlag, New York, 1999.
- [5] *Parallel Solution of Partial Differential Equations* (with P. Bjørstad), volume 120 of *IMA Volumes in Mathematics and Its Applications*. Springer-Verlag, New York, 2000.