

PUBLICATIONS OF MAX GUNZBURGER

Books

1. *Finite Element Methods for Viscous Incompressible Flows: A Guide to Theory, Practice and Algorithms*; Academic, Boston, 1989.
2. *Perspectives in Flow Control and Optimization*; SIAM, Philadelphia, 2003.
3. *Least Squares Finite Element Methods*; Springer, Berlin, 2009; with P. Bochev.
4. *An Algorithmic Introduction to Numerical Methods for Uncertainty Quantification for PDEs with Random Inputs*; to be published by Springer, Berlin, 2016; with C. Webster.

Edited books

5. *Incompressible Computational Fluid Dynamics: Trends and Advances*; Cambridge, Cambridge, 1993; with R. Nicolaides.
6. *Optimal Control and Design*; Birkhäuser, Boston, 1995; with J. Borggaard, J. Burkardt, and J. Peterson.
7. *Flow Control*; Springer, New York, 1995.

Journal articles

1. *Diffraction of shock waves by a moving thin wing*; J. Fluid Mech **42**, 1970, 585-608; with L. Ting.
2. *Motion of decaying vortex rings with non-similar vorticity distributions*; J. Engrg. Math. **6**, 1972, 53-61.
3. *Antisymmetric problems in shock diffraction theory*; Z. Angew. Math. Phys. **24**, 1973, 83-104; with V. Yang.
4. *Long time behavior of a decaying vortex*; Z. Angew. Math. Mech. **53**, 1973, 751-760.
5. *Mathematical formulation for the propagation of sound through a turbulent jet*; J. Engrg. Math. **10**, 1976, 219-230; with C. Liu, L. Maestrello, and L. Ting.
6. *Frequency modulation at a moving material interface and a conservation law for wave number*; J. Sound Vib. **48**, 1976, 169-178; with G. Kleinstein.
7. *On the mathematical conditions for the existence of periodic fluctuations in nonuniform media*; J. Sound Vib. **48**, 1976, 345-357; with G. Kleinstein.
8. *Downstream boundary conditions for viscous flow problems*; Comput. Math. Appl. **3**, 1977, 53-63; with G. Fix.
9. *On the stability of Galerkin methods for initial-boundary value problems for hyperbolic systems*; Math. Comp. **31**, 1977, 661-675.
10. *Application of the wavenumber jump condition to the normal and oblique interaction of a plane acoustic wave and a plane shock*; J. Sound Vib. **53**, 1977, 417-433; with G. Kleinstein.
11. *On the matrix equations $AH + HA^* = A^*H + HA = I$* ; Lin. Alg. Appl. **17**, 1977, 277-282; with D. Gottlieb.
12. *On least squares approximations to indefinite problems of the mixed type*; Int. J. Numer. Meth. Engrg. **12**, 1978, 453-469; with G. Fix.
13. *On the periodicity of ion-acoustic waves in an inhomogeneous plasma*; J. Plasma Phys. **20**, 1978, 345-350.
14. *Energy conserving norms for the solution of hyperbolic systems of partial differential equations*; Math. Comp. **33**, 1979, 1-10; with R. Plemmons.
15. *Simulation of the pressure field near a jet by randomly distributed vortex rings*; AIAA J. **17**, 1979, 553-557; with Y. Fung and C. Liu.
16. *On finite element methods of the least squares type*; Comput. Math. Appl. **5**, 1979, 87-98; with G. Fix and R. Nicolaides.
17. *On numerical methods for acoustics problems*; Comput. Math. Appl. **6**, 1980, 265-278; with G. Fix.
18. *On mixed finite element methods for first order elliptic systems*; Numer. Math. **37**, 1981, 29-48; with G. Fix and R. Nicolaides.
19. *Boundary conditions for the numerical solution of elliptic equations in exterior regions*; SIAM J. Appl. Math. **42**, 1982, 430-451; with A. Bayliss and E. Turkel.
20. *On conforming finite element methods for incompressible viscous flow problems*; Comput. Math. Appl. **8**, 1982, 167-179; with R. Nicolaides and J. Peterson.
21. *Stability of Gaussian elimination without pivoting on tridiagonal Toeplitz matrices*; Lin. Alg. Appl. **45**, 1982, 21-28; with R. Nicolaides.
22. *On the numerical boundary treatment of hyperbolic systems for finite difference and finite element methods*; SIAM J. Numer. Anal. **19**, 1982, 671-682; with D. Gottlieb and E. Turkel.
23. *A finite element method for the Onsager pancake equation*; Comput. Meth. Appl. Mech. Engrg. **31**, 1982, 43-59; with H. Wood.

24. *A finite element method for diffusion dominated unsteady viscous flows*; *Comput. Meth. Appl. Mech. Engrg.* **39**, 1983, 55-67; with C. Liu and R. Nicolaides.
25. *A least squares finite element scheme for transonic flow around harmonically oscillating airfoils*; *J. Comp. Phys.* **51**, 1983, 387-403; with C. Cox and G. Fix.
26. *On finite element approximations of problems having inhomogeneous essential boundary conditions*; *Comput. Math. Appl.* **9**, 1983, 687-700; with G. Fix and J. Peterson.
27. *On conforming finite element methods for the inhomogeneous stationary Navier-Stokes equations*; *Numer. Math.* **42**, 1983, 173-194; with J. Peterson.
28. *A finite element method for gas centrifuge problems*; *SIAM J. Sci. Stat. Comput.* **5**, 1984, 78-94; with J. Jordan and H. Wood.
29. *The effects of curvature on the flow field in rapidly rotating gas centrifuges*; *J. Fluid Mech.* **140**, 1984, 373-395; with J. Jordan and H. Wood.
30. *Elimination with noninvertible pivots*; *Lin. Alg. Appl.* **64**, 1985, 183-189; with R. Nicolaides.
31. *Algorithmic and theoretical results on computation of incompressible viscous flows by finite element methods*; *Comput. Fluids* **13**, 1985, 361-373; with C. Liu and R. Nicolaides.
32. *On substructuring algorithms and solution techniques for the numerical approximation of partial differential equations*; *Appl. Numer. Meth.* **2**, 1986, 243-256; with R. Nicolaides.
33. *A two time scale analysis of gyroscopic motion with friction*; *Z. Angew. Math. Phys.* **37**, 1986, 867-894; with H. Simpson.
34. *A finite element method for first order elliptic systems in three dimensions*; *Appl. Math. Comput.* **23**, 1987, 171-184; with C. Chang.
35. *On the approximation of the exterior Stokes problem in three dimensions*; *Math. Model. Numer. Anal.* **21**, 1987, 445-464; with G. Guirguis.
36. *Finite element methods for the streamfunction-vorticity equations: boundary condition treatments and multiply connected domains*; *SIAM J. Scient. Stat. Comput.* **9**, 1988, 650-668; with J. Peterson.
37. *A low dispersion, high accuracy finite element method for first order hyperbolic systems in several space variables*; *Comput. Math. Appl.* **15**, 1988, 447-457; with Q. Du and W. Layton.
38. *An analysis of approximations for an algebraic model of turbulence*; *Comput. Math. Appl.* **15**, 1988, 945-951; with J. Turner.
39. *On finite element approximations of the streamfunction-vorticity and velocity-vorticity equations*; *Int. J. Numer. Meth. Fluids* **8**, 1988, 1229-1240; with J. Peterson.
40. *Numerical approximation of an optimal control problem associated with the Navier-Stokes equations*; *Appl. Math. Let.* **2**, 1989, 29-31; with L. Hou and T. Svobodny.
41. *An algorithm for the boundary control of the wave equation*; *Appl. Math. Let.* **2**, 1989, 225-228; with R. Nicolaides.
42. *A study of the effects of baffles on rotating compressible flows*; *J. Appl. Mech.* **56**, 1989, 710-712; with R. Wayland and H. Wood.
43. *Finite element approximations of a Ladyzhenskaya model for stationary incompressible viscous flow*; *SIAM J. Numer. Anal.* **27**, 1990, 1-19; with Q. Du.
44. *A subdomain Galerkin/least squares method for first order elliptic systems in the plane*; *SIAM J. Numer. Anal.* **27**, 1990, 1197-1211; with C. Chang.
45. *Finite element approximations of an optimal control problem associated with the scalar Ginzburg-Landau equation*; *Comput. Math. Appl.* **21**, 1991, 123-131; with L. Hou and T. Svobodny.
46. *Analysis of a Ladyzhenskaya model for incompressible viscous flow*; *J. Math. Anal. Appl.* **155**, 1991, 21-45; with Q. Du.
47. *On the existence, uniqueness, and finite element approximation of solutions of the equations of stationary, incompressible magnetohydrodynamics*; *Math. Comp.* **56**, 1991, 523-563; with A. Meir and J. Peterson.
48. *Analysis and finite element approximations of optimal control problems for the stationary Navier-Stokes equations with distributed and Neumann controls*; *Math. Comp.* **57**, 1991, 123-151; with L. Hou and T. Svobodny.
49. *Predictor and steplength selection in continuation methods for the Navier-Stokes equations*; *Comput. Math. Appl.* **22**, 1991, 73-81; with J. Peterson.
50. *Analysis and finite element approximations of optimal control problems for the stationary Navier-Stokes equations with Dirichlet controls*; *Math. Model. Numer. Anal.* **25**, 1991, 711-748; with L. Hou and T. Svobodny.
51. *Boundary velocity control of incompressible flow with an application to viscous drag reduction*; *SIAM J. Cont. Optim.* **30**, 1992, 167-181; with L. Hou and T. Svobodny.
52. *Analysis and approximation of the Ginzburg-Landau model of superconductivity*; *SIAM Review* **34**, 1992, 54-81; with Q. Du and J. Peterson.

53. *Numerical solution of the compressible boundary layer equations using the finite element method*; AIAA J. **31**, 1993, 6-7; [Also appeared as AIAA Paper AIAA-92-0666, AIAA, Washington, 1992]; with E. Hytopoulos and J. Schetz.
54. *Treating inhomogeneous essential boundary conditions in finite element methods and the calculation of boundary stresses*; SIAM J. Numer. Anal. **29**, 1992, 390-424; with L. Hou.
55. *Solving the Ginzburg-Landau equations by finite element methods*; Phys. Rev. B **46**, 1992, 9027-9034; with Q. Du and J. Peterson.
56. *Numerical solution of the incompressible boundary layer equations using the finite element method*; J. Fluids Engrg. **114**, 1992, 504-511; with E. Hytopoulos and J. Schetz.
57. *Finite element approximation of a periodic Ginzburg-Landau model for type-II superconductors*; Numer. Math. **64**, 1993, 85-114; with Q. Du and J. Peterson.
58. *A least-squares finite element method for the Navier-Stokes equations*; Appl. Math. Lett. **6**, 1993, 27-30; with P. Bochev.
59. *Heating and cooling control of temperature distributions along boundaries of flow domains*; J. Math. Syst. Estim. Cont. **3**, 1993, 147-172; with L. Hou and T. Svobodny.
60. *The approximation of boundary control problems for fluid flows with an application to control by heating and cooling*; Comput. Fluids **22**, 1993, 239-251; with L. Hou and T. Svobodny.
61. *Modeling and analysis of a periodic Ginzburg-Landau model for type-II superconductors*; SIAM J. Applied Math. **53**, 1993, 689-717; with Q. Du and J. Peterson.
62. *Vibration of delaminated composite plates and some applications to non-destructive testing*; Compos. Struct. **23**, 1993, 253-262; with E. Henneke and L. Tenek.
63. *The accuracy of least-squares methods for the Navier-Stokes equations*; Comput. Fluids **22**, 1993, 549-563; with P. Bochev.
64. *A model for superconducting thin films having variable thickness*; Physica D **69**, 1993, 215-231; with Q. Du.
65. *Analysis, approximation, and computation of a coupled solid/fluid temperature control problem*; Comput. Meth. Appl. Mech. Engrg. **118**, 1994, 133-152; with H.-C. Lee.
66. *Analysis of least-squares finite element methods for the Stokes equations*; Math. Comp. **63**, 1994, 479-506; with P. Bochev.
67. *On the Lawrence-Doniach and anisotropic Ginzburg-Landau models for layered superconductors*; SIAM J. Appl. Math. **55**, 1995, 156-174; with S. Chapman and Q. Du.
68. *Computational simulation of type-II superconductivity including pinning phenomena*; Phys. Rev. B **51**, 1995, 16194-16203; with Q. Du and J. Peterson.
69. *Active control of instabilities in laminar boundary-layer flow: Use of sensors and spectral controller*; AIAA J. **33**, 1995, 1521-1523; with G. Erlebacher, M. Hussaini, R. Joslin, and R. Nicolaides.
70. *A Ginzburg-Landau type model of superconducting/normal junctions including Josephson junctions*; Europ. J. Appl. Math. **6**, 1995, 97-114; with S. Chapman and Q. Du.
71. *Simplified Ginzburg-Landau type models of superconductivity in the high kappa, high field limit*; Adv. Math. Sci. Appl. **5**, 1995, 193-218; with S. Chapman, Q. Du, and J. Peterson.
72. *Least-squares methods for the velocity-pressure-stress formulation of the Stokes equations*; Comput. Meth. Appl. Mech. Engrg. **126**, 1995, 267-287; with P. Bochev.
73. *Analysis and finite element approximation of optimal control problems for a Ladyzhenskaya model for stationary, incompressible, viscous flows*; J. Comp. Appl. Math. **61**, 1995, 323-343; with Q. Du and L. Hou.
74. *Analysis of a Monte Carlo boundary propagation method*; Comput. Math. Appl. **31**, 1996, 61-70; with R. Hiromoto and M. Mundt.
75. *Analysis of some boundary value problems for Stokes flows*; Kyungpook Math. J. **35**, 1996, 501-512; with H.-C. Lee.
76. *Finite dimensional approximation of a class of constrained nonlinear optimal control problems*; SIAM J. Cont. Opt. **34**, 1996, 1001-1043; with L. Hou.
77. *A model for variable thickness superconducting thin films*; Z. Angew. Math. Phys. **47**, 1996, 410-431; with J. Chapman and Q. Du.
78. *Feedback control of Karman vortex shedding*; J. Appl. Mech. **63**, 1996, 828-835; with H.-C. Lee.
79. *An optimal design problem for a two dimensional flow in a duct*; Opt. Control Appl. Meth. **17**, 1996, 329-339; with E. Cliff and X. Wu.
80. *An automated methodology for optimal flow control with an application to transition delay*; AIAA J. **35**, 1997, 816-824; with G. Erlebacher, M. Hussaini, R. Joslin, and R. Nicolaides.
81. *Difficulties in sensitivity calculations for flows with discontinuities*; AIAA J. **35**, 1997, 842-848; with J. Appel.
82. *Vortices in superconductors: modeling and computer simulations*; Phil. Trans. Royal Soc. London A **355**, 1997, 1957-1968; with J. Deang, Q. Du, and J. Peterson.

83. *Analysis and approximation of optimal control problems for a simplified Ginzburg-Landau model of superconductivity*; Numer. Math. **77**, 1997, 243-268; with L. Hou and S. Ravindran.
84. *The controllability of systems governed by parabolic equations*; J. Math. Anal. Appl. **215**, 1997, 174-189; with Y. Cao and J. Turner.
85. *Least-squares finite element approximations to solutions of interface problems*; SIAM J. Numer. Anal. **35**, 1998, 393-405; with Y. Cao.
86. *Boundary value problems and optimal boundary control for the Navier-Stokes system: The two-dimensional case*; SIAM J. Cont. Optim. **36**, 1998, 852-894; with A. Fursikov and L. Hou.
87. *Existence of an optimal solution of a shape control problem for the stationary Navier-Stokes equations*; SIAM J. Cont. Optim. **36**, 1998, 895-909; with H. Kim.
88. *Issues related to least-squares finite element methods for the Stokes problem*; SIAM J. Sci. Comput. **20**, 1998, 878-906; with J. Deang.
89. *Finite element methods of least squares type*; SIAM Review **40**, 1998, 789-837; with P. Bochev.
90. *Computations of optimal controls for incompressible flows*; Int. J. Comp. Fluid Dyn. **11**, 1998, 181-191; with L. Hou, S. Manservisi, and Y. Yan.
91. *Analysis and approximation of optimal control problems for first-order elliptic systems in three dimensions*; Appl. Math. Comp. **100**, 1999, 49-70; with H.-C. Lee.
92. *Analysis and computation of a mean-field model for superconductivity*; Numer. Math. **81**, 1999, 539-560; with Q. Du and H.-K. Lee.
93. *An optimization based domain decomposition method for partial differential equations*; Comp. Math. Appl. **37**, 1999, 77-93; with H.-K. Lee and J. Peterson.
94. *Sensitivities, adjoints, and flow optimization*; Inter. J. Num. Meth. Fluids. **31**, 1999, 53-78.
95. *The velocity tracking problem for Navier-Stokes flows with bounded distributed control*; SIAM J. Cont. Optim. **37**, 1999, 1913-1945; with S. Manservisi.
96. *Centroidal Voronoi tessellations: applications and algorithms*; SIAM Review **41**, 1999, 637-676; with Q. Du and V. Faber.
97. *A penalty/least-squares method for optimal control problems for first-order elliptic systems*; Appl. Math. Comp. **107**, 2000, 57-75; with H.-C. Lee.
98. *Solution of elliptic partial differential equations by an optimization-based domain decomposition method*; Appl. Math. Comp. **113**, 2000, 111-139; with M. Heinkenschloss and H.-K. Lee.
99. *A domain decomposition method for optimization problems for partial differential equations*; Comput. Math. Appl. **40**, 2000, 177-192; with J. Lee.
100. *An optimization-based domain decomposition method for the Navier-Stokes equations*; SIAM J. Numer. Anal. **37**, 2000, 1455-1480; with H.-K. Lee.
101. *Analysis and approximation of the velocity tracking problem for Navier-Stokes flows with distributed control*; SIAM J. Numer. Anal. **37**, 2000, 1481-1512; with S. Manservisi.
102. *A gradient method approach to optimization-based multidisciplinary simulations and nonoverlapping domain decomposition algorithms*; SIAM J. Numer. Anal. **37**, 2000, 1513-1541; with Q. Du.
103. *A variational inequality formulation of an inverse elasticity problem*; Appl. Numer. Math. **34** 2000, 99-126; with S. Manservisi.
104. *Global existence of weak solutions for incompressible viscous flow around a moving rigid body in three dimensions*; J. Math. Fluid Mech. **2**, 2000, 219-266; with H.-C. Lee and G. Seregin.
105. *The velocity tracking problem for Navier-Stokes flows with boundary control*; SIAM J. Cont. Optim. **39** 2000, 594-634; with S. Manservisi.
106. *Analysis and approximation for linear feedback control for tracking the velocity in Navier-Stokes flows*; Comp. Meth. Appl. Mech. Engrg. **189** 2000, 803-823; with S. Manservisi.
107. *Optimal control of stationary, low Mach number, highly nonisothermal viscous flows*; ESAIM:Cont. Optim. Calc. Var. **5** 2000, 477-500; with O. Imanuvilov.
108. *On a shape control problem for the stationary Navier-Stokes equations*; Math. Model. Numer. Anal. **34** 2000, 1233-1258; with H. Kim and S. Manservisi.
109. *Adjoint equation-based methods for control problems in viscous, incompressible flows*; Flow, Turbul., Comb. **65** 2000, 249-272.
110. *Stochastic dynamics of Ginzburg-Landau vortices in superconductors*; Phys. Rev. B **64** 2001, 052506; with J. Deang and Q. Du.
111. *Trace theorems for three-dimensional, time-dependent solenoidal vector fields and their applications*; Trans. Amer. Math. Soc. **354** 2001, 1079-1116; with A. Fursikov and L. Hou.

112. *Controlling transport phenomena in the Czochralski crystal growth process*; J. Crystal Growth **234** 2002, 47-62; with E. Ozugurlu, J. Turner, and H. Zhang.
113. *Inhomogeneous boundary value problems for the three-dimensional evolutionary Navier-Stokes equations*; J. Math. Fluid Mech. **4** 2002, 45-75; with A. Fursikov and L. Hou.
114. *Meshfree, probabilistic determination of point sets and support regions for meshless methods*; Comp. Meth. Appl. Mech. Engrg. **191** 2002, 1349-1366; with Q. Du and L. Ju.
115. *Nucleation of superconductivity in finite anisotropic superconductors and the evolution of surface superconductivity toward the bulk mixed state*; Phys. Rev. B **65** 2002, 094514; with J. Clem, J. Deang, and V. Kogan.
116. *Insensitive functionals, inconsistent gradients, spurious minima, and regularized functionals in flow optimization problems*; Inter. J. Comput. Fluid Dyn. **16** 2002, 171-185; with J. Burkardt and J. Peterson.
117. *Probabilistic algorithms for centroidal Voronoi tessellations and their parallel implementation*; Parallel Comput. **28** 2002, 1477-1500; with Q. Du and L. Ju.
118. *Modeling and computation of random thermal fluctuations and material defects in the Ginzburg-Landau model for superconductivity*; J. Comput. Phys. **181** 2002, 45-67; with J. Deang and Q. Du.
119. *Grid generation and optimization based on centroidal Voronoi tessellations*; Appl. Math. Comput. **133** 2002, 591-607; with Q. Du.
120. *Analysis of a linear fluid-structure interaction problem*; Disc. Cont. Dyn. Sys. **9** 2003, 633-650; with Q. Du, L. Hou, and J. Lee.
121. *Constrained centroidal Voronoi tessellations for surfaces*; SIAM J. Sci. Comput. **24** 2003, 1488-1506; with Q. Du and L. Ju.
122. *Voronoi-based finite volume methods, optimal Voronoi meshes, and PDEs on the sphere*; Comp. Meth. Appl. Mech. Engrg. **192** 2003, 3933-3957; with Q. Du and L. Ju.
123. *Semidiscrete finite element approximations of a model for the interactions of a Stokes fluid and a linear elastic solid*; SIAM J. Numer. Anal. **42** 2004, 1-29; with Q. Du, L. Hou, and J. Lee.
124. *A taxonomy of consistently stabilized finite element methods for the Stokes problem*; SIAM J. Sci. Comp. **25** 2004, 1585-1607; with T. Barth, P. Bochev, and J. Shadid.
125. *On inf-sup stabilized finite element methods for transient problems*; Comp. Meth. Appl. Mech. Engrg. **193** 2004, 1471-1489; with P. Bochev and J. Shadid.
126. *Least-squares finite element methods for optimization and control problems for the Stokes equations*; Comp. Math. Appl. **48** 2004, 1035-1057; with P. Bochev.
127. *Stability of the SUPG finite elements for transient advection-diffusion problems*; Comp. Meth. Appl. Mech. Engrg. **193** 2004, 2301-2323; with P. Bochev and J. Shadid.
128. *On the global unique solvability of initial-boundary value problems for the coupled modified Navier-Stokes and Maxwell equations*; J. Math. Fluid. Mech. **6** 2004, 462-482; with O. Ladyzhenskaya and J. Peterson.
129. *An absolutely stable pressure-Poisson stabilized finite element method for the Stokes equations*; SIAM J. Numer. Anal. **42** 2004, 1189-1207; with P. Bochev.
130. *Modeling and analysis of the forced Fisher equation*; Nonlin. Anal.: Theo. Meth. Appl. **62** 2005, 19-40; with S. Hou and W. Zhu.
131. *Optimal boundary control for the evolutionary Navier-Stokes system: the three-dimensional case*; SIAM J. Cont. Optim. **43** 2005, 2191-2232; with A. Fursikov and L. Hou.
132. *Optimal control of the time-periodic MHD equations*; Nonlin. Anal.: Theo. Meth. Appl. **63** 2005, e1687-e1699; with C. Trenchea.
133. *On least-squares finite element methods for the Poisson equation and their connection to the Dirichlet and Kelvin principles*; SIAM J. Numer. Anal. **43** 2005, 340-362; with P. Bochev.
134. *Fully discrete finite element approximations for the forced Fisher equation*; J. Math. Anal. Appl. **313** 2005, 419-440; with L. Hou and W. Zhu.
135. *Compatible discretizations of second-order elliptic problems*; Zap. Nauchn. Sem. POMI **318** 2005, 75-99; with P. Bochev.
136. *Analysis and discretization of an optimal control problem for the time-periodic MHD equations*; J. Math. Anal. Appl. **308** 2005, 440-466; with C. Trenchea.
137. *A finite element, multi-resolution viscosity method for hyperbolic conservation laws*; SIAM J. Numer. Anal. **43** 2005, 1988-2011; with M. Calhoun-Lopez.
138. *Centroidal Voronoi tessellation algorithms for image compression, segmentation, and multichannel restoration*; J. Math. Imag. Vision **24** 2006, 177-194; with Q. Du, L. Ju, and X. Wang.
139. *Least-squares finite element methods for optimality systems arising in optimization and control problems*; SIAM J. Numer. Anal. **43** 2006, 2517-2543; with P. Bochev.

140. *Comparison of pure and "Latinized" centroidal Voronoi tessellation against other statistical sampling methods*; Reliab. Engrg. Sys. Safe. **91** 2006, 1266-1280; with J. Burkardt, J. Peterson, and V. Romero.
141. *Semidiscrete approximations of optimal Robin boundary control problems constrained by semilinear parabolic PDEs*; J. Math. Anal. Appl. **323** 2006, 891-912; with K. Chrysafinos and L. Hou.
142. *Stabilization of low-order mixed finite elements for the Stokes equations*; SIAM J. Numer. Anal. **44** 2006, 82-101; with P. Bochev and C. Dohrmann.
143. *Centroidal Voronoi tessellation-based reduced-order modeling of complex systems*; SIAM J. Sci. Comput. **28** 2006, 459-484; with J. Burkardt and H.-C. Lee.
144. *On least-squares variational principles for the discretization of optimization and control problems*; Meth. Appl. Anal. **12** 2006, 395-426; with P. Bochev.
145. *A numerical method for exact boundary controllability problems for the wave equation*; Comp. Math. Appl. **51** 2006, 721-750; with L. Hou and L. Ju.
146. *POD and CVT-based reduced-order modeling of Navier-Stokes flows*; Comp. Meth. Appl. Mech. Engrg. **196** 2006, 337-355; with J. Burkardt and H.-C. Lee.
147. *Reduced-order modeling with multiple parameters*; Comp. Meth. Appl. Mech. Engrg. **196** 2006, 1030-1047; with J. Peterson and J. Shadid.
148. *Adaptive finite element methods for elliptic PDE's based on conforming centroidal Voronoi Delaunay triangulations*; SIAM J. Sci. Comput. **28** 2006, 2023-2053; with L. Ju and W. Zhao.
149. *On stabilized finite element methods for the Stokes problem in the small time-step limit*; Int. J. Numer. Meth. Fluids **53** 2007, 573-597; with P. Bochev and R. Lehoucq.
150. *Reduced order modeling of some nonlinear stochastic partial differential equations*; Int. J. Numer. Anal. Model. **4** 2007, 368-391; with J. Burkardt and C. Webster.
151. *Analysis of an optimal control problem for the three-dimensional coupled modified Navier-Stokes and Maxwell equations*; J. Math. Anal. Appl. **333** 2007, 295-310; with C. Trenchea.
152. *Analysis and discretization of an optimal control problem for the forced Fisher equation*; J. Disc. Cont. Dynam. Syst., Series B **8** 2007, 569587; with S. Yang and W. Zhu.
153. *Effect of sample geometry on the vortex configuration in mesoscopic superconductors*; Phys. Rev. B **72** 2007, 024509; with J. Burkardt, C.-R. Hu, S. Kim, and J. Peterson.
154. *The efficient implementation of a finite element, multi-resolution viscosity method for hyperbolic conservation laws*; J. Comp. Phys. **225** 2007, 1288-1313; with M. Calhoun-Lopez.
155. *Concurrent AtC coupling based on a blend of the continuum stress and the atomistic force*; Comp. Meth. Appl. Mech. Engrg. **196** 2007, 4548-4560; with S. Badia, J. Fish, M. Nuggehally, M. Parks, C. Picu, and M. Shephard.
156. *Latinized, improved LHS, and CVT point sets in hypercubes*; Int. J. Numer. Anal. Model. **4** 2007, 729743; with J. Burkardt and Y. Saka.
157. *A force-based blending model for atomistic-to-continuum coupling*; Inter. J. Multiscale Comp. Engrg. **5** 2007, 387-406; with S. Badia, P. Bochev, J. Fish, R. Lehoucq, M. Nuggehally, and M. Parks.
158. *Meshfree first-order system least squares*; Numer. Math. Theor. Meth. Appl. **1** 2008, 29-43; with J. Burkardt and H. MacMillan.
159. *On atomistic-to-continuum coupling by blending*; Multiscale Model. Simul. **7** 2008, 381-406; with S. Badia, P. Bochev, R. Lehoucq, and M. Parks.
160. *A locally conservative least-squares method for Darcy flows*; Comm. Numer. Meth. Engrg. **24** 2008, 97-110; with P. Bochev.
161. *A multi-resolution method for climate system modeling: Application of spherical centroidal Voronoi tessellations*; Ocean Dyn. **58** 2008, 475498; with L. Ju and T. Ringler.
162. *An adaptive wavelet viscosity method for hyperbolic conservation laws*; Num. Meth. PDE **24** 2008, 1388-1404; with D. Diez and A. Kunoth.
163. *Constrained CVT meshes and a comparison of triangular mesh generators*; Comp. Geom. Theo. Appl. **42** 2009, 1-19; with J. Burkardt, L. Ju, H. Nguyen, and Y. Saka.
164. *The ANOVA expansion and efficient sampling methods for parameter dependent nonlinear PDEs*; Int. J. Numer. Anal. Model. **6** 2009, 256-273; with Y. Cao and Z. Chen.
165. *Computational investigation of the effects of sample geometry on the superconducting-normal phase boundary and vortex-antivortex states in mesoscopic superconductors*; Comm. Comput. Phys. **6** 2009, 673-698; with C.-R. Hu, S. Kim, and J. Peterson.
166. *Adaptive anisotropic meshes for steady-state convection dominated equations*; Comp. Meth. Appl. Mech. Engrg. **198** 2009, 2964-2981; with J. Burkardt, J. Lili, and H. Nguyen.
167. *Well-posedness of the infinite Prandtl number model for convection with temperature-dependent viscosity*; Anal. Appl. **7** 2009, 297-308; with Y. Saka and X. Wang.

168. *Option pricing in the presence of random arbitrage*; Inter. J. Comput. Math. **6** 2009, 1068-1081; with J. Choi.
169. *Peridynamics as an upscaling of molecular dynamics*; Multiscale Model. Simul. **8** 2009, 204-227; with R. Lehoucq, M. Parks, and P. Seleson.
170. *An optimal control formulation of an image registration problem*; J. Math. Imaging Vision **36** 2010, 69-80; with E. Lee.
171. *Bridging methods for atomistic-to-continuum coupling and their implementation*; Comm. Comp. Phys. **7** 2010, 831-876; with P. Seleson.
172. *Quadrature-rule type approximations to the quasicontinuum method for short and long-range interatomic interactions*; Comp. Meth. Appl. Mech. Engrg. **199** 2010, 648-659; with Y. Zhang.
173. *Finite element approximations for Stokes-Darcy flow with Beaver-Joseph interface conditions*; SIAM J. Numer. Anal. **47** 2010, 4239-4256; with Y. Cao, X. Hu, F. Hua, X. Wang, and W. Zhao.
174. *A quadrature-rule type approximation for the quasicontinuum method*; Multiscale Model. Simul. **8** 2010, 571-590; with Y. Zhang.
175. *Coupled Stokes-Darcy model with Beavers-Joseph interface boundary condition*; Comm. Math. Sci. **8** 2010, 1-25; with Y. Cao, F. Hua, and X. Wang.
176. *Error analysis of finite element approximations of the stochastic Stokes equations*; Adv. Comput. Math. **33** 2010, 215-230; with Y. Cao and Z. Chen.
177. *Asymptotic analysis of the differences between the Stokes-Darcy system with different interface conditions and the Stokes-Brinkman system*; J. Math. Anal. Appl. **368** 2010, 658-676; with N. Chen and X. Wang.
178. *Advances in studies and applications of centroidal Voronoi tessellations*; Numer. Math. Theor. Meth. Appl. **3** 2010, 119-142; with Q. Du and L. Ju.
179. *Analysis of nonlinear spectral eddy-viscosity models of turbulence*; J. Sci. Comput. **45** 2010, 294-332; with E. Lee, Y. Saka, C. Trenchea, and X. Wang.
180. *Superconvergence analysis of FEMs for the Stokes-Darcy system*; Math. Meth. Appl. Sci. **33** 2010, 1605-1617; with W. Chen, P. Chen, and N. Yan.
181. *A nonlocal vector calculus with application to nonlocal boundary value problems*; Mult. Model. Simul. **8** 2010, 1581-1598; with R. Lehoucq.
182. *Partial and spectral-viscosity models for geophysical flows*; Chinese Annals Math. Ser. B **31** 2010, 579-606; with Q. Chen and X. Wang.
183. *Effects of approximate deconvolution models on the solution of the stochastic Navier-Stokes equations*; J. Comput. Math. **31** 2011, 131-140; with A. Labovsky.
184. *Continuous and discontinuous finite element methods for a peridynamics model of mechanics*; Comput. Meth. Appl. Mech. Engrg. **200** 2011, 1237-1250. with X. Chen.
185. *Robin-Robin domain decomposition methods for the steady-state Stokes-Darcy system with the Beavers-Joseph interface condition*; Numer. Math. **117** 2011, 601-629. with Y. Cao, X. He, and X. Wang.
186. *Space-time adaptive wavelet methods for optimal control problems constrained by parabolic evolution equations*; SIAM J. Control Optim. **49** 2011, 1150-1170; with A. Kunoth.
187. *Analysis and finite element approximation of a coupled, continuum pipe-flow/Darcy model for flow in porous media with embedded conduits*; Numer. Meth. PDEs **27** 2011, 1242-1252; with Y. Cao, F. Hua, and X. Wang.
188. *A parallel Robin-Robin domain decomposition method for the Stokes-Darcy system*; SIAM J. Numer. Anal. **49** 2011, 1064-1084; with W. Chen, F. Hua, and X. Wang.
189. *Pink noise, $1/f^\alpha$ noise, and their effect on solutions of differential equations*; Inter. J. Uncert. Quant. **1** 2011, 257-278; with J. Burkardt and M. Stoyanov.
190. *Coupled models and parallel simulations for three-dimensional full-Stokes ice-sheet modeling*; Numer. Math. Theory. Meth. Appl. **4** 2011, 396-418; with L. Ju, S. Price, T. Ringler, and H. Zhang.
191. *Analysis of finite element discretizations of an optimal control formulation of the image registration problem*; SIAM J. Numer. Anal. **49** 2011, 1321-1349; with E. Lee.
192. *Error estimates of stochastic optimal Neumann boundary control problems*; SIAM J. Numer. Anal. **49** 2011, 1532-1552; with H.-C. Lee and J. Lee.
193. *A scale-invariant formulation of the anticipated potential vorticity method*; Month. Weather Rev. **139** 2011, 2614-2629; with Q. Chen and T. Ringler.
194. *Maximizing critical currents in superconductors by optimizing several properties of normal inclusions*; Physica D **240** 2011, 1701-1713; with J. Peterson and Y. Zhang.
195. *Optimal control of stochastic flow in backward-facing step channel using reduced-order modeling*; SIAM J. Sci. Comp. **33** 2011, 2641-2663; with J. Ming.
196. *Exploring a multi-resolution modeling approach within the shallow-water equations*; Mon. Wea. Rev. **139** 2011, 3348-3368; with M. Duda, D. Jacobsen, L. Ju, T. Ringler, and W. Skamarock.

197. *A finite element, filtered eddy-viscosity method for the Navier-Stokes equations with large Reynolds number*; J. Math. Anal. Appl. **385** 2012, 384-398; with E. Lee.
198. *A parallel, high-order accurate finite element full-Stokes ice-sheet model with validation using benchmark experiments*; J. Geoph. Res. **117** 2012, F01001; with L. Ju, W. Leng, S. Price, and T. Ringler.
199. *Parallel finite element implementation for higher-order ice-sheet models*; J. Glaciology **58** 2012, 76-88; with J. Burkardt and M. Perego.
200. *Calibrating the exchange coefficient in the modified coupled continuum pipe-flow model for flows in karst aquifers*; J. Hydro. **414-415** 2012, 294-301; with N. Chen, B. Hu, X. Wang, and C. Woodruff.
201. *High accuracy method for turbulent flow problems*; Math. Model. Appl. Sci. **22** 2012, 1250005-1/25; with A. Labovsky.
202. *Approximation and application of the Musiela stochastic PDE in forward rate models*; Inter. J. Comp. Math. **89** 2012, 1269-1280; with J. Choi.
203. *Experimental and computational validation and verification of the Stokes-Darcy and continuum pipe flow models for karst aquifers with dual porosity structure*; Hydro. Proc. **26** 2012, 2031-2040; with Y. Cao, X. Hu, F. Hua, and X. Wang.
204. *Error analysis of a stochastic collocation method for parabolic partial differential equations with random input data*; SIAM J. Numer. Anal. **50** 2012, 1992-1940; with G. Zhang.
205. *A scale-aware anticipated potential vorticity method. Part II: on variable-resolution meshes*; Month. Weath. Rev. **140** 2012, 3127-3133; with Q. Chen and T. Ringler.
206. *Analysis and approximation of nonlocal diffusion problems with volume constraints*; SIAM Rev. **54** 2012, 667-696; with Q. Du, R. Lehoucq, and K. Zhou.
207. *Manufactured solutions and the numerical verification of isothermal, nonlinear, three-dimensional Stokes ice sheet models*; Cryosphere **7** 2013, 19-29. with L. Ju, W. Leng, and S. Price.
208. *A nonlocal vector calculus, nonlocal volume-constrained problems, and nonlocal balance laws*; Math. Model. Meth. Appl. Sci. **23** 2013, 493-540; with Q. Du, R. Lehoucq, and K. Zhou.
209. *A co-volume scheme for the rotating shallow water equations on conforming non-orthogonal grids*; J. Comput. Phys. **240** 2013, 174-197; with Q. Chen and T. Ringler.
210. *The collisionless plasma shock tube*; Phys. Plasmas **20** 2013, 052101; with J. Allen, P. Howell, J. Ockendon, and M. Perego.
211. *Efficient numerical methods for stochastic partial differential equations through transformation to equations driven by correlated noise*; Inter. J. Uncert. Quant. **3** 2013, 321-339; with J. Ming.
212. *A sparse grid method for high-dimensional backward stochastic differential equations*; J. Comput. Math. **31** 2013, 221-248; with G. Zhang and W. Zhao.
213. *Boundary optimal control of the steady MHD equations via extended constrained magnetic field*; Comm. Comp. Phys. **14** 2013, 722-752; with G. Bornia and S. Manservigi.
214. *Parallel algorithms for planar and spherical Delaunay construction with an application to centroidal Voronoi tessellations*; Geo. Mod. Develop. **6** 2013, 1-13; with J. Burkardt, D. Jacobsen, J. Peterson, and T. Ringler.
215. *The fractional Laplacian operator on bounded domains as a special case of the nonlocal diffusion operator*; Comp. Math. Appl. **66** 2013, 1245-1260; with M. D'Elia.
216. *Analysis of the volume-constrained peridynamic Navier equation of linear elasticity*; J. Elasticity **113** 2013, 193-217; with Q. Du, R. Lehoucq, and K. Zhou.
217. *Well-posedness results for a nonlinear Stokes problem arising in glaciology*; SIAM J. Math. Anal. **45** 2013, 2710-2733; with Q. Chen and M. Perego.
218. *Efficient and long-time accurate second-order methods for the Stokes-Darcy system*; SIAM J. Numer. Anal. **51** 2013, 2563-2584; with W. Chen, D. Sun, and X. Wang.
219. *Interface problems in nonlocal diffusion and sharp transitions between local and nonlocal domains*; Comput. Meth. Appl. Mech. Engrg. **266** 2013, 185-204; with M. Parks and P. Seleson.
220. *Coarse-grid sampling interpolatory methods for approximating Gaussian random fields*; SIAM/ASA J. Uncert. Quant. **1** 2013, 270-296; with M. D'Elia.
221. *An adaptive sparse-grid high-order stochastic collocation method for Bayesian inference in reactive transport models*; Water Resour. Res. **49** 2013, 1-22; with D. Liu, C. Webster, M. Ye, and G. Zhang.
222. *Time-discretized steady compressible Navier-Stokes equations with inflow and outflow boundaries*; ZAMP **64** 2013, 1745-1758; with M. Song, S.-D. Yang, and G. Yoon.
223. *Unified matching grids for multidomain multiphysics simulations*; SIAM J. Sci. Comp. **35** 2013, A2781-A2806; with J. Peterson, T. Ringler, and G. Womeldorff.
224. *Peridynamic state-based models and the embedded-atom model*; Comm. Comput. Phys. **15** 2014, 179-205; with M. Parks and P. Seleson.

225. *An efficient and accurate method for the identification of the most influential random parameters appearing in the input data for PDEs*; SIAM/ASA J. Uncert. Quant. **2** 2014, 82-105; with A. Labovsky.
226. *Optimal distributed control of nonlocal steady diffusion problems*; SIAM J. Cont. Optim. **52** 2014, 243-273; with M. D'Elia.
227. *Goal-oriented a posteriori error estimation for finite volume methods*; J. Comput. Appl. Math. **265** 2014, 69-82; with Q. Chen.
228. *Parallel non-iterative domain decomposition methods for the time-dependent Stokes-Darcy system*; Math. Comp. **83** 2014, 1617-1644; with Y. Cao, X. He, and X. Wang.
229. *Stochastic finite element methods for partial differential equations with random input data*; Acta Numerica **23** 2014, 521-650; with C. Webster and G. Zhang.
230. *An adaptive sparse-grid-based iterative ensemble Kalman filter approach for parameter field estimation*; Inter. J. Comp. Math. **91** 2014, 798-817; with C. Webster and G. Zhang.
231. *Finite element three-dimensional Stokes ice sheet dynamics model with enhanced local mass conservation*; J. Comp. Phys. **274** 2014, 299-311; with T. Ciu, L. Ju, W. Leng, and Y. Xie.
232. *Simulating vesicle-substrate adhesion using two phase field functions*; J. Comp. Phys. **275** 2014, 626-641; with R. Gu and X. Wang.
233. *Fractional diffusion on bounded domains*; Fract. Calc. Appl. Anal. **18** 2015, 342-360; with O. Defterli, M. D'Elia, Q. Du, R. Lehoucq, and M. Meerschaert.
234. *Power-law noises over general spatial domains and on non-standard meshes*; SIAM/ASA J. Uncer. Quant. **3** 2015, 296-310; with J. Burkardt, M. Stoyanov, and H.-W. van Wyk.
235. *Stability and convergence of time-stepping methods for a nonlocal model for diffusion*; Disc. Cont. Dynam. Sys.-B **20** 2015, 1315-1335; with Q. Guan.
236. *A hyperspherical adaptive sparse-grid method for high-dimensional discontinuity detection*; SIAM J. Numer. Anal. **53** 2015, 1508-1536; with J. Burkardt, C. Webster, and G. Zhang.
237. *Stability and accuracy of time-stepping schemes and dispersion relations for a nonlocal wave equation*; Numer. Method. PDE **31** 2015, 500-516; with Q. Guan.
238. *Peridynamics and material interfaces*; J. Elasticity **120** 2015, 225-248; with B. Alali.
239. *A multilevel stochastic collocation method for partial differential equations with random input data*; SIAM/ASA J. Uncert. Quant. **3** 2015, 1046-1074; with P. Jantsch, A. Teckentrup, and C. Webster.
240. *A generalized nonlocal calculus*; J. Appl. Math. Phys. **66** 2015, 2807-2828; with B. Alali and K. Liu.
241. *Stochastic steady-state Navier-Stokes equations with additive random noise*; J. Sci. Comput. **66** 2016, 672-691; with L. Hou and J. Ming.
242. *Identification of the diffusion parameter in nonlocal steady diffusion problems*; Appl. Math. Optim. **73** 2016, 227-249; with M. D'Elia.
243. *A multiscale implementation based on adaptive mesh refinement for the nonlocal peridynamics model in one dimension*; Multiscale Model. Simul. **14** 2016, 398-429; with J. Burkardt, Q. Du, and F. Xu.
244. *A least-squares finite element method for a nonlinear Stokes problem in glaciology*; Comput. Appl. Math. Appl. **71** 2016, 2421-2431; with E. Lee, I. Monnesland, and R. Yoon.
245. *Numerical solution of backward stochastic differential equations with jumps for a class of nonlocal diffusion problems*; Comput. Appl. Math. Appl. **71** 2016, 2479-2496; with C. Webster, G. Zhang, and W. Zhao.
246. *Nodal-type collocation methods for hypersingular integral equations and nonlocal diffusion problems*; Comput. Meth. Appl. Mech. Engrg. **299** 2016, 401-420; with L. Ju and X. Zhang.
247. *A multiscale method for nonlocal mechanics and diffusion and for the approximation of discontinuous functions*; Comp. Meth. Appl. Mech. Engrg. **307** 2016, 117-143; with J. Burkardt and F. Xu.
248. *A two phase field model for tracking vesicle-vesicle adhesion*; J. Math. Bio.; ?? 2016, 1-27; with R. Gu and X. Wang.
249. *Quadrature rules for finite element approximations of 1D nonlocal problems*; submitted; J. Comp. Phys. **310** 2016, 213-236.

Accepted

250. *A parallel computational model for three-dimensional, thermo-mechanical Stokes flow simulations of glaciers and ice sheets*; to appear in J. Comp. Phys.; with L. Ju, W. Leng, and S. Price.
251. *Thermomechanically coupled modeling for land-terminating glaciers: A comparison of two-dimensional, first-order and three-dimensional, full Stokes approaches*; to appear in J. Glaciology; with L. Ju, S. Price, Y. Tong, and W. Leng.
252. *An efficient and long-time third-order accurate algorithm for the Stokes-Darcy system*; to appear in Numer. Math.; with W. Chen, D. Sun, and X. Wang.

253. *Reduced-order modeling for nonlocal diffusion problems*; to appear in *Inter. J. Numer. Meth. Fluids*; with J. Peterson and D. Witman.
254. *Hyperspherical sparse approximation techniques for high-dimensional discontinuity detection*; to appear in *SIAM Review*; with C. Webster and G. Zhang.
255. *Asymptotically compatible schemes for the approximation of fractional Laplacian and related nonlocal diffusion problems on bounded domains*; to appear in *Advan. Comput. Math.*; with Q. Du and X. Tian.
256. *Optimal model management for multifidelity Monte Carlo estimation*; to appear in *SIAM J. Scien. Comp.*; with B. Peherstorfer and K. Willcox.

Submitted

257. *Optimal control of stochastic cylinder flow using polynomial chaos expansion*; submitted; with L. Hou and J. Ming.
258. *Analysis and approximation of a nonlocal obstacle problem*; submitted; with Q. Guan.
259. θ -schemes for finite element discretization of the space-time fractional diffusion equations; submitted; with Q. Guan.
260. *Applicability of a two-dimensional, first-order Stokes approximation flowline model for the simulation of land-terminating glacier*; submitted; with L. Ju, W. Leng, S. Price, and T. Zhang.
261. *An ensemble-proper orthogonal decomposition method for the nonstationary Navier-Stokes equations*; submitted; with N. Jiang and M. Schneier.
262. *Well posedness of a coupled ice-hydrology problem arising in glaciology*; submitted; with L. Bertagna.
263. *Reduced basis methods for nonlocal diffusion problems with random input data*; submitted; with Q. Guan, C. Webster, and G. Zhang.

Book chapters

264. *Simulation by vortex rings of the unsteady pressure field near a jet*; *Progress in Astronautics and Aeronautics* **43**, AIAA and MIT, 1976, 47-64; with C. Liu and L. Maestrello.
265. *Theory and application of mixed finite element methods*; *Constructive Approaches to Mathematical Models*, Academic, 1979, 375-393; with G. Fix and R. Nicolaides.
266. *On mixed finite element methods for a class of nonlinear boundary value problems*; *Computational Methods in Nonlinear Mechanics*, North-Holland, 1980, 245-260; with G. Fix and R. Nicolaides.
267. *Mathematical aspects of finite element methods for incompressible viscous flows*; *Finite Elements: Theory and Practice*, Springer, 1988, 124-150.
268. *Optimal control and optimization of viscous, incompressible flows*; *Incompressible Computational Fluid Dynamics: Trends and Advances*, Cambridge, 1992, 109-150; with L. Hou and T. Svobodny.
269. *Sensitivity calculations for a 2D, inviscid, supersonic forebody problem*; *Identification and Control of Systems Governed by Partial Differential Equations*, SIAM, Philadelphia, 1993, 14-24; with J. Borggaard, J. Burns, and E. Cliff.
270. *Algorithms for flow control and optimization*; *Optimal Design and Control*, Birkäuser, Boston, 1995, 97-116; with J. Borggaard, J. Burkardt, J. Burns, E. Cliff, H. Kim, H. Lee, J. Peterson, A. Shenoy, and X. Wu.
271. *A prehistory of flow control and optimization*; *Flow Control*, Springer, New York, 1995, 185-195.
272. *Flow control and optimization*; *Computational Fluid Dynamics Review*, Wiley, West Sussex, 1995, 548-566.
273. *Navier-Stokes equations for incompressible flows: finite element methods*; *Handbook on Computational Fluid Mechanics*, Academic, Boston, 1996, 99-157.
274. *Introduction into mathematical aspects of flow control and optimization*; *Inverse Design and Optimisation Methods*, von Karman Institute for Fluid Dynamics, Rhode-Saint-Genèse, Belgium, 1997.
275. *Approximate solutions via sensitivities*; *Inverse Design and Optimisation Methods*, von Karman Institute for Fluid Dynamics, Rhode-Saint-Genèse, Belgium, 1997; with J. Appel.
276. *Lagrange multiplier techniques*; *Inverse Design and Optimisation Methods*, von Karman Institute for Fluid Dynamics, Rhode-Saint-Genèse, Belgium, 1997.
277. *Optimal control problems for a class of nonlinear equations with an application to the control of fluids*; *Optimal Control of Viscous Flows*, SIAM, Philadelphia, 1998, 43-62; with L. Hou and T. Svobodny.
278. *Adjoint methods*; *Design Optimal et MDO*, Centre de Recherche en Calcul Appliqué, Montréal, 1998, 1-25.
279. *Optimal control problems for the Navier-Stokes equations*; in *Lectures on Applied Mathematics*, Springer, Berlin 2000; with A. Fursikov, S. Hou, and S. Manservigi.
280. *The inf-sup condition in mixed finite element methods with application to the Stokes system*; in *Collected Lectures on the Preservation of Stability Under Discretization*, SIAM, Philadelphia, 2002, 93-121.
281. *Least-squares/penalty finite element methods for optimization and control problems*; in *Real-Time PDE-Constrained Optimization*, SIAM, Philadelphia, 2007, 73-93; with P. Bochev.

282. *The Ginzburg-Landau equations for superconductivity with random fluctuations*; in Sobolev Spaces in Mathematics III: Applications in Mathematical Physics, Springer, Berlin, 2009, 25-133; with A. Fursikov and J. Peterson.
283. *Blending methods for coupling atomistic and continuum models*; in Multiscale Methods: Bridging the Scales in Science and Engineering, Oxford, Oxford, 2010, 165-189; with S. Badia, P. Bochev, R. Lehoucq, and M. Parks.
284. *Voronoi tessellations and their application to climate and global modeling*; in Numerical Techniques for Global Atmospheric Models, Springer, Berlin, 2011, 313-342; with L. Ju and T. Ringler.
285. *An adaptive wavelet stochastic collocation method for irregular solutions of partial differential equations with random input data*; in Sparse Grids and Applications, Lecture Notes in Computational Science and Engineering 97, 137-170, Springer; with C. Webster and G. Zhang.
286. *Least squares finite element methods*, Encyclopedia of Applied and Computational Mathematics, Springer, Berlin, 2015, 782-785; with P. Bochev.
287. *A multiscale mono-model for mechanics*, Oberwolfach Reports 8, 169-199.
288. *Sparse collocation methods for stochastic interpolation and quadrature*, to appear in Handbook on Uncertainty Quantification, Springer; with C. Webster and G. Zhang.
289. *Least-squares methods for hyperbolic problems*, to appear in Handbook of Numerical Methods for Hyperbolic Problems: Part A; Elsevier; with P. Bochev.

Proceedings articles

290. *New results in the finite element solution of steady viscous flows*; The Mathematics of Finite Elements and its Applications IV, Academic, 1982, 463-470; with R. Nicolaides.
291. *On numerical boundary conditions for hyperbolic systems*; Proc. 1981 Army Numerical Analysis and Computers Conference ARO 81-3, U.S. Army Research Office, 1981, 221-232; with W. Layton.
292. *Mixed finite element methods for acoustics and flow problems*; Proc. AIAA 5-th Computational Fluid Dynamics Conference AIAA CP814, AIAA, 1981, 265-271; with G. Fix, R. Nicolaides and J. Peterson.
293. *New discretization and solution techniques for incompressible viscous flow problems*; Proc. AIAA 6-th Computational Fluid Dynamics Conference AIAA CP834, AIAA, 1983, 665-671; with C. Liu and R. Nicolaides.
294. *A numerical study of the effects of curvature on the fluid dynamics of gas centrifuges*; Proc. 5-th Workshop on Gases in Strong Rotation, U. of Virginia, 1983, 745-800; with J. Jordan and H. Wood.
295. *Finite element algorithms for incompressible viscous flows*; Proc. 1983 NASA Theoretical Aerodynamics Contractors' Workshop, NASA Langley Research Center, 1983, 317-328; with C. Liu and R. Nicolaides.
296. *On the approximation of the exterior Stokes problem in three dimensions*; Proc. 5-th International Symposium on Finite Elements and Flow Problems; U. of Texas at Austin, 1984, 149-154; with G. Guirguis.
297. *Mixed finite element approximations for the biharmonic equation*; Proc. 5-th International Symposium on Finite Elements and Flow Problems, U. of Texas at Austin, 1984, 281-286; with G. Fix, R. Nicolaides and J. Peterson.
298. *Numerical boundary conditions for flow problems*; Trans. 1-st Army Conference on Applied Mathematics and Computing ARO 84-1, U.S. Army Research Office, 1984, 567-580; with G. Fix.
299. *Least squares approximations to compressible flow problems*; Trans. 1-st Army Conference on Applied Mathematics and Computing ARO 84-1, U.S. Army Research Office, 1984, 581-585; with G. Fix.
300. *On the finite element approximation of the streamfunction-vorticity equations*; Advances in Computer Methods for Partial Differential Equations V, IMACS, 1984, 47-56; with J. Peterson.
301. *Issues in the implementation of substructuring algorithms for the Navier-Stokes equations*; Advances in Computer Methods for Partial Differential Equations V, IMACS, 1984, 57-63; with R. Nicolaides.
302. *Some aspects of finite element approximations of incompressible viscous flows*; Computational Methods in Viscous Flows, Pineridge, 1984, 173-189; with R. Nicolaides.
303. *Boundary layer flows over obstacles*; Proc. 1984 NASA Theoretical Aerodynamics Contractors' Workshop, NASA Langley Research Center, 1984, 655-680; with C. Liu and R. Nicolaides.
304. *Algorithmic aspects of high Reynolds number solutions to incompressible Navier-Stokes equations*; Proc. 1985 NASA Theoretical Aerodynamics Contractors' Workshop, NASA Langley Research Center, 1985, 809-824; with C. Liu and R. Nicolaides.
305. *Normal modes of orthotropic plates*; Proc. 12-th International Congress on Acoustics, IUPAP, 1986, K3-3; with A. Meir and R. Schumacher.
306. *A non-standard finite element method of higher accuracy for hyperbolic systems in several space variables*; Advances in Computer Methods for Partial Differential Equations VI, IMACS, 1987, 92-97; with Q. Du and W. Layton.
307. *Error estimates and implementation issues for artificial boundary condition methods for exterior problems*; Advances in Computer Methods for Partial Differential Equations VI, IMACS, 1987, 338-345; with G. Guirguis.
308. *Finite element methods for a Ladyzhenskaya model of incompressible viscous flow*; Numerical Methods in Laminar and Turbulent Flow V, Pineridge, 1987, 161-169; with Q. Du.

309. *Finite element methods for vorticity formulations of incompressible viscous flows*; Numerical Methods in Laminar and Turbulent Flow V, Pineridge, 1987, 170-181; with J. Peterson.
310. *Analysis of geometric effects on rotating compressible flows*; Proc. of the Workshop on Separation Phenomena in Liquids and Gases, Technische Hochschule Darmstadt, Darmstadt, 1987, 602-642; with R. Wayland and H. Wood.
311. *Iterative penalty methods for the Stokes and Navier-Stokes equations*; Finite Element Analysis in Fluids, University of Alabama, Huntsville, 1989, 1040-1045.
312. *Experiences with computational methods for the velocity-vorticity formulation of incompressible viscous flow*; Computational Methods in Viscous Aerodynamics, Elsevier, 1990, 231-271; with M. Mundt and J. Peterson.
313. *A numerical method for drag minimization via the suction and injection of mass through the boundary*; Stabilization of Flexible Structures, Springer, 1990, 312-321; with L. Hou and T. Svobodny.
314. *Optimal boundary control of nonsteady incompressible flow with an application to viscous drag reduction*; Proc. 29th IEEE Conf. Decision and Control, IEEE, 1990, 377-378; with L. Hou and T. Svobodny.
315. *Analysis, approximation, and computation of control problems for incompressible flows*; Turbulence Structure and Control, Ohio State, 1991, 85-88.
316. *Control of temperature distributions along boundaries of engine components*; Numerical Methods in Laminar and Turbulent Flow VII, Pineridge, 1991, 765-773; with L. Hou and T. Svobodny.
317. *Vorticity constraints in velocity-vorticity formulations of steady, viscous, incompressible flow*; Numerical Methods in Laminar and Turbulent Flow VII, Pineridge, 1991, 774-781; with Q. Du and A. Meir.
318. *Approximation of boundary control and optimization problems for fluid flows*; 4th Int. Symposium on Computational Fluid Dynamics, U. California, Davis, 1991, 455-460; with L. Hou and T. Svobodny.
319. *Numerical solution of the boundary layer equations using the finite element method*; Advances in Finite Element Analysis in Fluid Mechanics FED-123, ASME, 1991, 29-38; with E. Hytopoulos and J. Schetz.
320. *Mathematical and computational studies of macroscopic models of superconductivity*; Proc. Symposium on Applied Mathematics, Chinese Academy of Sciences, Beijing, 1992, 284-293; with Q. Du and J. Peterson.
321. *On the Ginzburg-Landau equations of superconductivity*; Partial Differential Equations, Longman, 1992, 58-62; with Q. Du and J. Peterson.
322. *Issues in shape optimization for the Navier-Stokes equations*; Proc. 31th IEEE Conf. Decision and Control, IEEE, 1992, 3390-3392; with J. Peterson.
323. *The reduced basis method in control problems*; Computation and Control III Birkäuser, Cambridge, 1993, 211-218; with J. Peterson.
324. *Least-squares methods for incompressible viscous flows and algorithms for flow control problems*; Research in Computational Mathematics, Washington University, St. Louis, 1993, 11-13.
325. *Basic issues in the finite element approximation of viscous incompressible flows*; Proc. Applied Math. Workshop on Numerical Analysis: Finite Element Methods, KAIST, Taejon, Korea, 1993, 1-20.
326. *Analysis and algorithms for flow control and optimization problems*; Proc. Applied Math. Workshop on Numerical Analysis: Finite Element Methods, KAIST, Taejon, Korea, 1993, 21-41.
327. *Models and computational methods for superconductivity*; Proc. Applied Math. Workshop on Numerical Analysis: Finite Element Methods, KAIST, Taejon, Korea, 1993, 43-60.
328. *Research in computational fluids and flow control*; Research in Computational Mathematics, Phillips Laboratory, Albuquerque, 1994.
329. *Boundary control of incompressible flows*; Computational Fluid Dynamics Techniques, Harwood, UK, 1994 839-846; with L. Hou and T. Svobodny.
330. *Analysis of weighted least-squares finite element methods for the Navier-Stokes equations*; Proc. 14th IMACS World Congress on Computational and Applied Mathematics, Georgia Tech, Atlanta, 1994, 584-587; with P. Bochev.
331. *Feedback control of fluid flows*; Proc. 14th IMACS World Congress on Computational and Applied Mathematics, Georgia Tech, Atlanta, 1994, 716-719; with H.-C. Lee.
332. *Analysis and approximation of optimal control problems with nonlinear constraints*; Proc. 33th IEEE Conf. Decision and Control, IEEE, Lake Buena Vista, 1994, 299-304; with L. Hou, S. Ravindran, and J. Turner.
333. *Sensitivity discrepancy for geometric parameters*; CFD for Design and Optimization, ASME, New York, 1995, 9-15; with J. Burkardt.
334. *Optimization-based design in high-speed flows*; CFD for Design and Optimization, ASME, New York, 1995, 61-68; with J. Appel, E. Cliff, and A. Godfrey.
335. *Discretization of cost and sensitivities in shape optimization*; Computation and Control IV, Birkäuser, 1995, 43-56; with J. Burkardt and J. Peterson.
336. *Sensitivity analysis and optimal control of flows*; Computational and Physical Mathematics, Phillips Laboratory, Albuquerque, 1995, 5-7.

337. *Ginzburg-Landau type models for superconductivity*; Proc. First World Congress of Nonlinear Analysts, de Gruyter, Berlin, 1996, 3779-3788; with Q. Du and J. Peterson.
338. *A methodology for the automated optimal control of flows including transitional flows*; Proc. ASME Forum on Control of Transitional and Turbulent Flows FED-237, ASME, 1996, 287-294; with G. Erlebacher, M. Hussaini, R. Joslin, and R. Nicolaides.
339. *Sensitivity calculation in flows with discontinuities*; AIAA Paper 96-2471, Proc. 14th AIAA Applied Aerodynamics Conference, AIAA, 1996; with J. Appel.
340. *Least squares finite element methods for viscous, incompressible flows*; Proc. Fluids Engineering Division Summer Meeting, FEDSM97-3487, ASME; with P. Bochev.
341. *On exact controllability and convergence of optimal controls to exact controls of parabolic equations*; Optimal Control: Theory, Algorithms, and Applications, Kluwer, 1998, 67-83; with Y. Cao and J. Turner.
342. *A domain decomposition method for the Navier-Stokes equations*; Proc. 17th Workshop in Pure Mathematics; Korean Academic Council, Seoul, 1998, 13-33; with H.-K. Lee.
343. *Sensitivities in computational methods for optimal flow control*; Computational Methods for Optimal Design and Control, Birkhäuser, Boston, 1998, 197-236.
344. *Optimal Dirichlet control and inhomogeneous boundary value problems for the unsteady Navier-Stokes equations*; Control of Partial Differential Equations, ESAIM Proceedings **4**, SMAI, Paris, 1998, 97-116; with A. Fursikov and L. Hou.
345. *Domain decomposition for partial differential equations through optimization*; Proc. Korean Advanced Institute for Science and Technology Mathematics Workshop on Finite Elements, 1999, 1-20; with H. Kwon and J. Peterson.
346. *Least-squares finite element methods with application to the Stokes equations*; Proc. Korean Advanced Institute for Science and Mathematics Technology Workshop on Finite Elements, 1999, 21-40; with P. Bochev and J. Deang.
347. *Optimal boundary control of the Navier-Stokes equations with bounds on the control*; Proc. Korean Advanced Institute for Science and Technology Mathematics Workshop on Finite Elements, 1999, 41-60; with A. Fursikov and L. Hou.
348. *Approximation of a mean field model for superconductivity*; Proc. Korean Advanced Institute for Science and Mathematics Technology Workshop on Finite Elements, 1999, 61-72; with Q. Du and H.-K. Lee.
349. *Optimization-based methods for multidisciplinary simulation and optimization*; in Proc. 8th Annual Conference of the CFD Society of Canada, CERCA, Montreal, 2000, 689-694; with Q. Du and J. Lee.
350. *Adjoint and sensitivity-based methods for optimization of gas centrifuges*; Proc. 7th Work. Separation Phenomena in Liquids and Gases; Moscow Engineering Physics Institute, Moscow, 2000, 89-99; with H. Wood.
351. *Shape design of channel flows for steady, incompressible flows*; Proc. 39th Conf. Decision and Control, IEEE; with H. Kim and S. Manservigi.
352. *Magnetic control of transport phenomena in CZ crystal growth processes*; Proc. IMECE'01, ASME; with E. Ozugurlu, J. Turner, and H. Zhang.
353. *Flow matching by shape design for the Navier-Stokes system*; International Series of Numerical Mathematics **139**, Birkhäuser, Basel, 2001, 279-289; with S. Manservigi.
354. *On stabilized finite element methods for transient problems with varying time scales*; Fifth World Congress on Computational Mechanics, (CD-ROM), IACM, Vienna, 2002; with P. Bochev and J. Shadid.
355. *Model reduction by proper orthogonal decomposition coupled with centroidal Voronoi tessellation*; Proc. Fluids Engineering Division Summer Meeting, FEDSM2002-31051, ASME, 2002; with Q. Du.
356. *Centroidal Voronoi tessellation based proper orthogonal decomposition analysis*; Control and Estimation of Distributed Parameter Systems, Birkhäuser, Basel, 2003, 137-150; with Q. Du.
357. *Initial application and evaluation of a promising new sampling method for response surface generation: Centroidal Voronoi tessellations*; AIAA Paper 2003-2008, Proc. 44th AIAA/AME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, AIAA, 2003; with J. Burkardt, K. Krishnamurthy, J. Peterson, and V. Romero.
358. *Approximation of exact boundary controllability problems for the 1-D wave equation by optimization-based methods*; Recent Advances in Scientific Computing and Partial Differential Equations, AMS, Providence, 2003, 133-153; with L. Hou and L. Ju.
359. *Reduced-order modeling of complex systems*; Numerical Analysis 2003: Proceedings of the 20th Biennial Conference on Numerical Analysis, University of Dundee, Dundee, 2003, 29-38; with J. Burkardt, Q. Du, and H.-C. Lee.
360. *Initial evaluation of centroidal Voronoi tessellation method for statistical sampling and function integration*; Fourth International Symposium on Uncertainty Modeling and Analysis, ISUMA 2003, 174-183; Extended version appeared as report number SAND2003-3672C, Sandia National Laboratories, Albuquerque, 2003; with J. Burkardt, J. Peterson, and V. Romero.
361. *Reduced-order modeling of Navier-Stokes equations via centroidal Voronoi tessellation*; Recent Advances in Adaptive Computation, AMS, Providence, 2004, 213-224; with H. Lee.

362. *On stabilized finite element methods for transient problems with varying time scales*; European Congress on Computational Methods in Applied Sciences and Engineering (ECCOMAS2004), Jivaskyla, Finland, 2004; with P. Bochev and R. Lehoucq.
363. *Initial evaluation of pure and latinized centroidal Voronoi tessellation for non-uniform statistical sampling*; in Sensitivity Analysis of Model Output, K. Hanson and F. Hemez, eds., Los Alamos National Laboratory, Los Alamos, 2005, 380-401; with J. Burkardt, J. Peterson, and V. Romero.
364. *Reduced-order modeling of complex systems with multiple system parameters*; Large Scale Scientific Computing: 5th International Conference, Sozopol, Bulgaria, 2005, Springer, Berlin, 2006, 15-27; with J. Peterson.
365. *Least-squares finite element methods*; Proc. Inter. Congress Mathematicians, Madrid, Spain, 2006, III 1137-1162; with P. Bochev.
366. *Bridging methods for coupling atomistic and continuum models*; Large Scale Scientific Computing: 6th International Conference, Sozopol, Bulgaria, 2007, Springer, Berlin, 2008, 16-27; with S. Badia, P. Bochev, R. Lehoucq, and M. Parks.
367. *1D atomistic-to-continuum coupling via optimization*; to Proc. 4th Inter. Conf. Multiscale Materials Modeling, Florida State University, Tallahassee, 2008, 53-56; with J. Reese.
368. *Approximating the quasicontinuum method using quadrature rules*; in Proc. 4th Inter. Conf. Multiscale Materials Modeling, Florida State University, Tallahassee, 2008, 57-60; with Y. Zhang.
369. *Finite element methods for a peridynamic model of mechanics*; in Proc. 4th Inter. Conf. Multiscale Materials Modeling, Florida State University, Tallahassee, 2008, 76; with X. Chen.
370. *Bridging methods and boundary treatment for AtC coupling problems*; in Proc. 4th Inter. Conf. Multiscale Materials Modeling, Florida State University, Tallahassee, 2008, 77-80; with P. Seleson.
371. *A locally conservative mimetic least-squares finite element method for the Stokes equations*; Large Scale Scientific Computing: 7th International Conference, Sozopol, Bulgaria, 2009, Springer, Berlin, 2010, 637-644; with P. Bochev.
372. *A nonlocal vector calculus and finite element methods for nonlocal diffusion and mechanics*, Report No. 04/2011, Mathematisches Forschungsinstitut Oberwolfach, 2011, 175-177; with X. Chen, Q. Du, R. Lehoucq, and K. Zhou.
373. *Connecting peridynamic models and coupling local and nonlocal systems* Report No. 04/2011, Mathematisches Forschungsinstitut Oberwolfach, 2011, 194-196; with Max Gunzburger and M. Parks and P. Seleson.
374. *An efficient surrogate modeling approach in Bayesian uncertainty analysis*; Proc. 11th Intern. Conf. Numer. Anal. Appl. Math. 2013, Rhodes, Greece, AIP Conf. Proc. **1558** 2013, 898-901; with D. Lu, C. Webster, M. Ye, and G. Zhang.
375. *A multilevel stochastic collocation method for SPDEs*; Proc. 12th Intern. Conf. Numer. Anal. Appl. Math., Rhodes, Greece, AIP Conf. Proc. **1648** 2014, 020005; with P. Jantsch, A. Teckentrup, and C. Webster

Technical reports (not appearing as articles)

376. *Numerical program and examples for diffraction of shock by wings*; New York University Report AA-69-8, New York, 1969; with F. Chow.
377. *On the application of the finite difference boundary value method to the calculation of the Born-Oppenheimer vibrational eigenenergies for the double minimum $E, F^{-1}\Sigma_g^+$ state of the hydrogen molecule*; ICASE Report 76-5, Hampton, 1976; with R. Raffanetti.
378. *On mixed finite element methods I: The Kelvin Principle*; ICASE Report 77-17, Hampton, 1977; with G. Fix and R. Nicolaides.
379. *On mixed finite element methods II: The least squares method*; ICASE Report 77-18, Hampton, 1977; with G. Fix and R. Nicolaides.
380. *On mixed finite element methods III: The grid decomposition property and examples*; ICASE Report 78-7, Hampton, 1978; with G. Fix and R. Nicolaides.
381. *The computational accuracy of some finite element methods for incompressible viscous flow problems*; ICASE Report 81-7, Hampton, 1981; with R. Nicolaides.
382. *Solution of Onsager's equation for a rotating compressible fluid in a multiply connected region*; U. of Virginia Report UVA-ER-970-85U, Charlottesville, 1985; with R. Wayland and H. Wood.
383. *COMPOS-TG1, a finite element computer program for three dimensional analysis of composite plates*; Virginia Tech, Blacksburg, , 1990; with L. Tenek.
384. *An optimization problem involving a linear two-point boundary value problem*; ICAM Report 91-07-02, Virginia Tech, Blacksburg, 1991; with J. Burns and E. Cliff.
385. *An optimization problem involving a nonlinear two-point boundary value problem*; ICAM Report 91-07-03, Virginia Tech, Blacksburg, 1991; with J. Burns and E. Cliff.
386. *Equations for the sensitivities for the 2D, inviscid, supersonic forebody problem*; ICAM Report 91-07-05, Virginia Tech, Blacksburg, 1991; with J. Burns and E. Cliff.

387. *Control and optimal design of flow systems with CFD*, Short course notes, CERCA, Montreal, 2000.
388. *User manual and supporting information for library of codes for centroidal Voronoi point placement and associated zeroth, first, and second moment determination*; SAND Report SAND2002-0099, Sandia National Laboratories, Albuquerque, 2002; with R. Brannon, J. Burkardt, and J. Peterson.

Miscellaneous publications

389. *Finite Element Solution of Boundary Value Problems – Theory and Computation*; by O. Axelsson and V. Baker; Academic, Orlando, 1984; SIAM Review **30**, 1988, 143-144. [Book review]
390. *Mathematical models in superconductivity*; SIAM News, **27** 1994; with J. Ockendon. [News article]
391. *Viscous Vortical Flows*; by L. Ting and R. Klein; Springer, Berlin, 1991; SIAM Review **37**, 1995, 124-127. [Book review]
392. *George Fix*; SIAM News, **35** 2002. [Obituary]
393. *Olga Ladyzhenskaya*; SIAM News, **37** 2004; with G. Seregin. [Obituary]
394. *Reduced-order models of large-scale computational systems*; SIAM News, **38/5** 2005; with K. Willcox. [News article]
395. *CSE2007: Fourth conference in SIAM series showcases new methods, broadening set of applications*; SIAM News, **40/5** 2007; with B. Hendrickson and A. Wathen. [News article]
396. *CSE2007: Numerical methods for stochastic PDEs*; SIAM News, **40/5** 2007. [News article]
397. *Bulgarian SIAM section co-sponsors international conference on scientific computing*; SIAM News, **40/7** 2007; with P. Bochev, R. Lazarov, and S. Margenov. [News article]
398. *Argentinean section of SIAM co-sponsors international conference on applied, computational, and industrial mathematics*; SIAM News, **41/4** 2008; with R. Spies. [News article]
399. *Fifteen ways to fool the masses when presenting your UQ work*; SIAM News, **42/8** 2012. [News article]
400. *Uncertainty quantification in the partial differential equation setting*; Mathematical Intelligencer Special Issue for ICIAM16; with C. Webster.