

CURRICULUM VITAE

Richard S. Falk

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Education:

B.S., Applied Mathematics, Brown University, 1966
Ph.D., Applied Mathematics, Cornell University, 1971

Employment:

Research Associate, Brown University, 1971-72
Assistant Professor, Rutgers University, 1972-76
Associate Professor, Rutgers University, 1976-82
Professor I, Rutgers University, 1982-89
Distinguished Professor, Rutgers University, 1989-2018
Distinguished Professor Emeritus, Rutgers University, 2018-

Grant Funding:

NSF Grants: 1975-1976, 1978-2012
NSF Special projects grant, computer equipment, 1985-86
New Jersey Dept. of Higher Ed. Computers in Curricula, 1985-86

Honors:

Fellow of the American Mathematical Society (AMS), 2018, (for contributions to numerical analysis and for service to the mathematical community).
Fellow of the Society for Industrial and Applied Mathematics (SIAM), 2012, (for contributions to the understanding of the stability and convergence properties of the finite element method, and for service to the numerical analysis community).
Daniel Gorenstein Memorial Award, April 24, 2007: (given for outstanding scholarly achievement to a Rutgers faculty member who has also performed exceptional service to the University community).

Professional Activities:

Co-organizer: Finite Element Circus, 1996 - 2016 (meetings in my field of specialization held twice yearly at rotating locations), host of October, 2005, April, 2012, and April 2017 meetings at Rutgers University
Co-organizer: IMA Special Workshop: Structure-Preserving Discretizations of Partial Differential Equations, October 22-24, 2014

Member: SIAM Science Policy Committee, January 2009-January 2012
Member: 2009 James H. Wilkinson Prize Committee
Co-organizer: Mini-symposium on Advances in the Mathematics of the Finite Element Method, at 8th US National Congress on Computational Mechanics, July 25-27, 2005, Austin Texas.
Recent NSF Panels: 2004, 2007, 2008, 2009
Associate Editor, Mathematics of Computation, February, 1996-December, 2004
Member: Editorial Board: SIAM Journal on Numerical Analysis, January, 1989-December, 1997
Member: Society of Industrial and Applied Mathematics
Member: American Mathematical Society

Visiting Positions:

September 23 – October 12, 2019: Isaac Newton Institute for Mathematical Sciences
October 3 – November 4, 2011: Dipartimento di Matematica, Università di Pavia, Italy
September 19 – December 18, 2010: Institute for Mathematics and its Applications
April 20 – May 20, 1998: Mittag-Leffler Institute, Stockholm
September – December, 1994: The Pennsylvania State University
September, 1986 – May, 1987: Courant Institute of Mathematical Sciences
October, 1986 and April, 1987: Institute for Mathematics and its Applications, University of Minnesota
September – December 1983: University of Maryland
April – May, 1983: Göteborg University, Sweden
June, 1979: Université de Rennes, France
February – May 1979: Université Paris VI
September, 1978-January 1979: Mathematics Research Center, University of Wisconsin
January, 1976: École Polytechnique, Palaiseau, France

Recent Rutgers Activities: 1996-2018

2017-2018

Chair: School of Arts and Sciences Compensation Review Committee
Member: New Brunswick Provost Search Committee
Member: RDI² Advisory Committee

2016-2017

Chair: School of Arts and Sciences Compensation Review Committee
Member: Department of Mathematics Personnel Planning Committee

2015-2016

Chair: School of Arts and Sciences Compensation Review Committee
Member: Department of Mathematics Peer Evaluation Committee
Member: Mathematics Department Chair Search Committee
Alternate: Department of Mathematics Personnel Planning Committee

2014-2015

2013-2014

Acting Executive Dean School of Arts and Sciences

2012-2013

Acting Executive Dean School of Arts and Sciences

2011-2012

Sabbatical Leave: Fall 2011 at Centre of Mathematics for Applications (University of Oslo) and Dipartimento di Matematica, Università di Pavia

Mathematics Department Chair Search Committee

Rutgers Research Council Committee

2010-2011

Sabbatical Leave; Fall 2010 at the Institute for Mathematics and its Applications
Chair: School of Arts and Sciences Committee on Facilities, Resource Management, and Planning

Member: MSMF Steering Committee

2009-2010

Chair: Committee on Academic Planning and Review

Member: RU FAIR ADVANCE: Advisory Board

Member: Computer Coordinating Council

Member: Department of Mathematics Personnel Evaluation Committee

Chair: Mathematics Department Computer Committee

Member: MSMF Steering Committee

Member: NJ PEMSM Geometry Course Writing Committee

2008-2009

Chair: Committee on Academic Planning and Review

Chair: OIT Review Committee

Member: RU FAIR ADVANCE: Advisory Board

Member: Computer Coordinating Council

Member: Department of Mathematics Personnel Planning Committee

Member: Department of Mathematics Personnel Evaluation Committee

Chair: Mathematics Department Computer Committee

Member: MSMF Steering Committee

2007-2008

Chair: Committee on Academic Planning and Review

Member: Information Technology Project Governance Committee

Member: Steering Committee of the Supplemental Systems Committee

Member: Computer Coordinating Council

Member: Department of Mathematics Personnel Planning Committee

Chair: Mathematics Department Computer Committee

Member: Department of Mathematics Personnel Evaluation Committee

Member: MSMF Steering Committee

2006-2007

Chair: Committee on Academic Planning and Review
Member: Information Technology Project Governance Committee
Member: Steering Committee of the Supplemental Systems Committee
Member: Computer Coordinating Council
Member: Department of Mathematics Personnel Planning Committee
Chair: Mathematics Department Computer Committee

2005-2006

Chair: Committee on Academic Planning and Review (formerly CSPAD)
Member: Information Technology Strategic Planning Committee;
Chair: Subcommittee on IT Governance
Member: Information Technology Project Governance Committee
Member: Computer Coordinating Council
Member: Department of Mathematics Personnel Planning Committee
Member: Department of Mathematics Personnel Evaluation Committee
Member: Nominating Committee of the Graduate School

2004-2005

Chair: Department of Mathematics
Chair: Committee on Standards and Priorities in Academic Development
Member: Information Technology Strategic Planning Committee;
Chair: Subcommittee on IT Governance
Member: Information Technology Project Governance Committee
Member: Nominating Committee of the Graduate School

2003-2004

Sabbatical Leave: Fall 2003
Chair: Department of Mathematics
Member: FAS Ad Hoc Committee on Restructuring
Member: Nominating Committee of the Graduate School (3-year term)

2002-2003

Chair: Department of Mathematics
Co-Chair: Information Technology Coordinating Committee

2001-2002

Chair: Department of Mathematics
Co-Chair: Information Technology Coordinating Committee

2000-2001

Acting Executive Dean, Faculty of Arts of Sciences
Acting Dean of the Graduate School, New Brunswick

1999-2000

Chair: Department of Mathematics
Member: Committee on Standards, Priorities, and Academic Development
Chair: New Brunswick Computing Advisory Committee

Member: High-Speed Network Applications Committee

1998-1999

Chair: New Brunswick Computing Advisory Committee

Member: Committee on Standards, Priorities, and Academic Development

Member: Mathematics Department Personnel Planning Committee

Member: Mathematics Department Undergraduate Committee

Member: Mathematics Department FASIP salary committee

Course Coordinator – Math 244, Math 251

1997-1998

Member: Committee on Standards, Priorities, and Academic Development

Member: RUNet 2000 Project Advisory Committee

Chair: New Brunswick Computing Advisory Committee

Member: FAS Computer Advisory Committee

Member: Mathematics Department Personnel Planning Committee

Member: Mathematics Department Undergraduate Committee

Member: Mathematics Department FASIP salary committee

Course Coordinator – Math 251

1996-1997

Acting Chair of the Department of Mathematics

Member: RUNet 2000 Project Advisory Committee

Member: Information Systems/Information Technology Self-Study Committee
(MSA accreditation)

Doctoral Students:

Tong Tu, “Performance of Reissner-Mindlin Elements,” October, 1998.

Jian Ming Xu, “An Analysis of the Dynamical Equations of Elastic Rods and Their Numerical Approximation,” May, 1992.

Stephen M. Alessandrini, “Some Two-dimensional Plate Models: Derivation, Asymptotic Properties, and Numerical Approximation, October, 1991.

Da-mu Cai, Reduced Continuity Finite Element Methods for Hyperbolic Equations, October, 1990.

Peter B. Monk, “Some Finite Element Methods for the Approximation of the Biharmonic Equation,” January, 1983.

Jin-Sheng Jiang, “A Lagrange Multiplier Finite Element Method for the Stationary Stokes Problem,” May, 1983.

Recent Talks:

“Numerical Computation of Hausdorff Dimension,” Seminar, Isaac Newton Institute for Mathematical Sciences, October 9, 2019.

“Commuting, polynomial extension operators for differential forms,” ICIAM Minisymposium: Finite element exterior calculus and applications, July 16, 2019.

- “The bubble transform and the de Rham complex: polynomial preserving cut-off operators,” Workshop on higher order methods in finite element exterior calculus, Oslo, Norway, June 6, 2018.
- “A new approach to numerical computation of the Hausdorff dimension of invariant sets associated to iterated function systems,” Minisymposium on “Structure preserving and high order discretization,” ENUMATH 2017 Conference, Voss, Norway, September 25, 2017.
- “Construction of bounded cochain projections and their role in the FE exterior calculus,” BIRS Workshop on Connections in Geometric Numerical Integration and Structure-Preserving Discretization, June 15, 2017.
- “Mixed finite element approximation of the vector Laplacian: Why boundary conditions matter.” Applied and Computational Mathematics Seminar, University of California, Irvine. November 21, 2016.
- “Mixed finite element approximation of the vector Laplacian: Why boundary conditions matter.” Workshop on structure and scaling in computational field theories.” University of Oslo, October 28, 2016.
- “Numerical computation of Hausdorff dimension,” International Conference on Computational Mathematics and Inverse Problems, Michigan Tech University, August 15, 2016.
- “A new approach to numerical computation of Hausdorff dimension of invariant sets associated to iterated function systems,” Numerical Analysis seminar, University of Maryland, October 6, 2015.
- “Numerical computation of Hausdorff dimension,” Workshop on Finite Elements, Peking University, August 15, 2015.
- “A survey of mixed simplicial finite elements for elasticity with weak symmetry,” Minisymposium on Advances on Finite Elements for Mixed Finite Element Methods for Linear Elasticity, ICIAM, Beijing, August 13, 2015.
- “Finite Element Exterior Calculus and Applications,” Numerical Analysis Seminar, Courant Institute of Mathematical Sciences, March 6, 2015.
- “A Mixed FEM for EWOD that Directly Computes the Position of the Moving Interface,” Conference on Applied Analysis for the Materials Sciences, Luminy, France, May 29, 2013.
- “Application of the Finite Element Exterior Calculus to the Equations of Linear Elasticity,” NSF/CBMS Conference: Finite Element Exterior Calculus, ICERM, June 12, 2012.
- “Finite Element Exterior Calculus,” Mathematics Department Colloquium, Wayne State University, March 26, 2012.
- “Application of the Finite Element Exterior Calculus to the Equations of Linear Elasticity,” Minisymposium on Exploiting Geometry in the Development of Numerical Methods for Partial Differential Equations, SIAM Conference on Analysis of Partial Differential Equations, November 15, 2011.
- “Overview of the Finite Element Exterior Calculus,” Workshop on Geometric Numerical Methods for PDE, UC San Diego, November 13, 2011.
- “Mixed Finite Element Approximation of the Vector Laplacian with Dirichlet BC,”

- Seminar, University of Pavia, Pavia, Italy, October 12, 2011.
- “Note on a Mixed Finite Element Method for the 2-D Vector Laplacian and Stokes Problems,” Minisymposium on Geometric and Exterior Calculus Methods in Computational Mechanics, USNCCM-11 Meeting, Minneapolis, MN, July 28, 2011.
- “Remarks on a Mixed Finite Element Method for the 2-D Vector Laplacian and Stokes Problems,” Minisymposium on Computational Methods for Geometric PDEs, ICIAM Meeting, Vancouver, B.C., July 19, 2011.
- “Finite Element Exterior Calculus,” Mathematics Department Colloquium, University of Maryland, College Park, March 18, 2011.
- “Canonical families of finite element differential forms and their properties,” Workshop: Non-Standard Numerical Methods for PDE’s, Pavia, Italy, June 29, 2010.
- “Approximation by Quadrilateral and Hexahedral Finite Elements,” Seminar, Institute for Computational Engineering and Sciences (ICES), Univ. of Texas, April 15, 2010.
- “Bounded cochain projections and approximation of the Hodge Laplacian,” Special session on recent progress in numerical methods for partial differential equations, AMS meeting, Lexington, KY, March 27, 2010.
- “Finite element exterior calculus,” Complex Analysis and Geometry Seminar, Rutgers University, March 12, 2010.
- “Finite element exterior calculus,” Topology-Geometry Seminar, Rutgers University, November 17, 2009.
- “Bounded cochain projections and approximations of the Hodge Laplacian,” Conference on Compatible and Innovative Discretizations for Partial Differential Equations, CMA, Oslo, Norway, June 18, 2009.
- “Finite Element Exact Sequences and Applications,” Seminar, Institute for Computational Engineering and Sciences (ICES), Univ. of Texas, November 6, 2008.
- “Geometric decompositions and bases for spaces of piecewise polynomial differential forms,” Workshop on Nonstandard Finite Element Methods, Mathematisches Forschungsinstitut, Oberwolfach Germany, August 12, 2008.
- “Geometric decompositions and bases for spaces of piecewise polynomial differential forms,” Minisymposium on Mathematical Foundations of Computational Mechanics at IACM/ECCOMAS 2008, Venice, Italy, July 3, 2008.
- “Approximation by Quadrilateral and Hexahedral Finite Elements,” Conference honoring James Bramble – Half a Century in Mathematics, Texas A&M University, May 2, 2008.
- “A new approach to finite element methods for the equations of linear elasticity,” Numerical analysis seminar, University of Maryland, April 22, 2008.
- “Numerical Stability is a Subtle Issue,” Rees Distinguished Lecture, Department of Mathematical Sciences, University of Delaware, November 9, 2007.
- “Mathematical Modeling and Numerical Approximation,” Rees Distinguished Lecture, Department of Mathematical Sciences, University of Delaware, November 7, 2007.
- “Finite element methods for problems in elasticity,” Bernard Coleman symposium, 44th Technical Meeting, Society of Engineering Science, Texas A&M University,

- October 23, 2007.
- “A new approach to finite element methods for the equations of linear elasticity,” seminar, Department of Mathematics, Texas A&M University, October 22, 2007.
- “Finite element methods for problems in elasticity,” Seminar, Army Research Laboratory, Aberdeen, Maryland, October 9, 2007.
- “Simplicial finite element families: properties and connections,” 9th US National Congress on Computational Mechanics, San Francisco, July 23, 2007.
- “Application of Finite Element Exterior Calculus to Elasticity,” 6th International Congress on Industrial and Applied Mathematics, Zurich, Switzerland, July 19, 2007.
- “Finite element exterior calculus and numerical stability,” Seminar, Tsinghua University, Beijing, China, May 31, 2007.
- “Finite element exterior calculus and numerical stability,” International Conference on Partial Differential Equations and Applications, Beijing Normal University, May 30, 2007.
- “Mixed finite element methods for the equations of linear elasticity with weakly imposed symmetry,” Computational and Applied Mathematics Colloquium, Penn State University, April 13, 2007.
- “Finite element exact sequences,” Graduate Student Pizza Luncheon Seminar, Penn State University, April 13, 2007.
- “A Fortin operator for Taylor-Hood elements,” Finite Element Circus, Penn State University, November 4, 2006.
- “A Fortin operator for Taylor-Hood elements,” Finite Element Circus, Penn State University, November 4, 2006.
- “Finite Element Methods for Linear Elasticity,” C.I.M.E. Summer School on Mixed Finite Elements, Compatibility Conditions, and Applications, Cetraro, Italy, June 26-July 1, 2006.
- “Finite Elements for the Reissner-Mindlin Plate,” C.I.M.E. Summer School on Mixed Finite Elements, Compatibility Conditions, and Applications, Cetraro, Italy, June 26-July 1, 2006.
- “Mixed Finite Elements For Elasticity: A Constructive Approach,” Conference on Compatible Discretizations for Partial Differential Equations, Centre of Mathematics for Applications, University of Oslo, September 27, 2005.
- “Mixed Finite Elements With Weak Symmetry For Linear Elasticity: A Constructive Approach,” 8th US National Congress on Computational Mechanics, Austin, Texas, July 5, 2005.
- “Mixed finite element methods for linear elasticity with weakly imposed symmetry,” Finite Element Circus, Syracuse University, April 30, 2005.
- “Finite Element Methods for Hyperbolic Systems,” Conference on Numerical Relativity, Banff International Research Station, Banff, Canada, April 19, 2005.
- “Mixed Finite Element Methods for the Equations of Linear Elasticity with Weakly Imposed Symmetry,” Applied Mathematics Seminar, University of Delaware, November 9, 2004.

- “Approximation by Piecewise Polynomials and Applications,” College of Science and Mathematics Seminar, Montclair State University, September 23, 2004.
- “Locking Free Discontinuous Galerkin Methods for the Reissner-Mindlin Plate Without Reduced Integration,” European Congress on Computational Methods in Applied Sciences and Engineering, Jyväskylä, Finland, July 25, 2004.
- “Remarks on Irregular Hexahedral Finite Elements,” 7th U.S.National Congress on Computational Mechanics, Albuquerque, NM, July 29, 2003.
- “Finite element approximation theory using families of reference elements,” Finite Element Circus, Wayne State Univ., March 28, 2003.
- “Remarks on Quadrilateral Reissner-Mindlin Plate Elements,” Seminar, University of Pavia, July 23, 2002.
- “Remarks on Quadrilateral Reissner-Mindlin Plate Elements,” Fifth World Congress on Computational Mechanics, Vienna, Austria, July 8, 2002.
- “Overview of Finite Element Methods for Linear Hyperbolic Problems, Workshop on Numerical Relativity, IMA, University of Minnesota, June 28, 2002.
- “Quadrilateral Finite Elements,” Numerical Analysis Seminar, University of Maryland, March 19, 2002.
- “Quadrilateral $H(\text{div})$ Finite Elements,” Finite Element Circus, University of Maryland, March 8, 2002.
- “An Overview of Reissner-Mindlin Plate Elements,” Conference on Mixed Finite Element Methods, Oberwolfach, Germany, February 5, 2001.
- “An Overview of Reissner-Mindlin Plate Elements,” Conference on Finite Element Analysis and Eigenvalue Problems, University of Maryland, September 16, 2000.
- “Analysis of Finite Element Methods for Linear Hyperbolic Problems,” International Symposium on Discontinuous Galerkin Methods: Theory, Computation, and Applications, Newport, R.I., May 26, 1999.
- “Locking-Free Finite Elements for the Reissner-Mindlin Plate”, Special Session on Finite Elements in Mechanics, SIAM National Meeting, Atlanta, GA, May 14, 1999.
- “Locking-Free Finite Elements for the Reissner-Mindlin Plate Model,” Applied and Computational Math Seminar, Penn State University, October 16, 1998.
- “The Reissner-Mindlin Plate Model: Derivation, Properties, and Finite Element Approximation,” Workshop on State of the Art in Finite Element Method – Theory, Algorithm, and Applications, City University of Hong Kong, July 21, 1998.
- “Equilibrium Shape of Deformable Elastic Crystals,” Mittag-Leffler Mathematics Institute, Stockholm, May 5, 1998.
- “Nonconforming Finite Elements: Be Careful When You Use Them,” Session on Mixed, Hybrid and Special Finite Element Methods, Congress ISAAC’97, University of Delaware, June 5, 1997.
- “Equilibrium Shape of Deformable Elastic Crystals,” Finite Element Circus, Courant Institute, April 19, 1997.
- “Preconditioning Mixed and Least Squares Finite Element Methods,” AMS Meeting, Special Session on Numerical Solution of Differential Equations, University of Maryland, April 12-13, 1997.

- “Nonconforming Finite Elements: Properties and Applications,” Numerical Analysis Seminar, Courant Institute, March 28, 1997.
- “Space-Time Finite Elements for a Problem in Surface Diffusion,” AMS Meeting, Special Session on Numerical Solutions for Partial Differential Equations, University of Memphis, March 22, 1997.
- “Nonconforming Finite Elements: Properties and Applications,” Colloquium, University of Maryland, Baltimore County, November 15, 1996.
- “Nonconforming Finite Elements: Properties and Applications,” Numerical Analysis Seminar, University of Oslo, Norway, June 11, 1996.
- “Preconditioning in $H(\text{div})$ and Applications,” Ninth International Conference on Domain Decomposition Methods, Ullensvang, Norway, June 6, 1996.
- “Preconditioning in $H(\text{div})$ and Applications,” Numerical Analysis Seminar, Göteborg University, Sweden, May 31, 1996.
- “Nonconforming Finite Elements: Properties and Applications,” Numerical Analysis Seminar, Inst. for Math. and its Applications, Univ. of Minnesota, March 11, 1996.
- “Preconditioning discrete approximations of the Reissner-Mindlin plate model,” Conference on Mathematics and its Application to Numerical Analysis and to Physical Problems, Univ. of Maryland, May 7, 1995.
- “Discrete Helmholtz decompositions and applications,” Numerical Analysis Seminar, Univ. of Maryland, April, 13, 1995.
- “Preconditioning discrete approximations of the Reissner-Mindlin plate model,” Finite Element Circus, Brookhaven National Laboratory, March 25, 1995.
- “Discrete Helmholtz decompositions and applications,” Colloquium, Univ. of Tennessee, March, 15, 1995.
- “Surface Diffusion: Perturbation Analysis and Finite Element Approximation,” Applied Math Seminar, Univ. of Tennessee, March, 17, 1995.
- “Surface Diffusion: Perturbation Analysis and Finite Element Approximation,” Applied Math Seminar, Texas A & M Univ., February, 15, 1995.
- “Surface Diffusion: Perturbation Analysis and Finite Element Approximation,” Colloquium, Southern Methodist Univ., February, 9, 1995.
- “Surface Diffusion: Perturbation Analysis and Finite Element Approximation,” Applied Math Seminar, Penn State Univ., December 2, 1994.
- “Derivation and Asymptotic Properties of Some Two Dimensional Plate Models,” Conference on the Mathematics of Finite Elements and Applications, Brunel University, April 27, 1993.
- “Derivation of Some Two Dimensional Plate Models,” Finite Element Circus, University of Maryland, April 16, 1993.
- “Derivation, Asymptotic Properties, and Numerical Approximation of Some Two Dimensional Plate Models,” Conference on Asymptotics and Adaptivity in Computational Mechanics, Oberwolfach, Germany, February 3, 1993.
- “Comments on Mixed Finite Element Methods for Problems with Rough Coefficients,” 7th IMACS International Conference on Computer Methods for Partial Differential Equations, June 23, 1992.

- “A Finite Element Method for a Minimum Energy Plate Model,” 7th IMACS International Conference on Computer Methods for Partial Differential Equations, June 23, 1992.
- “Some Two-dimensional Plate Models: Derivation, Asymptotic Properties, and Numerical Approximation,” Numerical Analysis Seminar, University of Maryland, November 21, 1991.
- “Two-dimensional Plate Models: Derivation, Asymptotic Properties, and Numerical Approximation,” Finite Element Circus, Penn State Univ., November 8, 1991.
- “The Reissner-Mindlin Plate Model: Numerical Methods and Boundary Layers,” Applied Math Seminar, University of Delaware, November 14, 1990.
- “Remarks on Finite Element Methods for Elasticity Problems,” Applied Math Seminar, Penn State University, September 7, 1990.
- “The Reissner-Mindlin Plate Model: Numerical Methods and Boundary Layers,” Math Dept. Colloquium, Temple University April 30, 1990.

Publications:

1. Approximation of a class of optimal control problems with order of convergence estimates, *J. Math. Anal. & Appl.*, 44(1) (1973), 28-47.
2. Error estimates for the approximation of a class of variational inequalities, *Math. of Comp.*, 28 (1974), 963-971.
3. Approximation of an elliptic boundary value problem with unilateral constraints, *R.A.I.R.O.*, 9e annee, aout 1975, R-2, 5-12.
4. An analysis of the penalty method and extrapolation for the stationary Stokes equations, *Proc. of AICA Int. Symp.*, R. Vichnevetsky, ed., 66-69.
5. A penalty and extrapolation method of the stationary Stokes equations (with J.T. King), *SIAM J. on Numerical Analysis*, 13 (1976), 814-829.
6. A finite element method for the stationary Stokes equations using trial functions which do not have to satisfy $\operatorname{div} v = 0$, *Math. of Comp.*, 30 (1976), 698-702.
7. A Ritz method based on a complementary variational principle, *R.A.I.R.O.*, 10 (1976), 39-48.
8. An analysis of the finite element using Lagrange multipliers for the stationary Stokes equations, *Math. of Comp.*, 30 (1976), 241-249.
9. Approximation of the biharmonic equation by a mixed finite element method, *SIAM J. on Numerical Analysis*, 15 (1978), 556-567.
10. Error estimates for elasto-plastic problems (with B. Mercier), *R.A.I.R.O.*, 11 (1977), 135-144.
11. An error estimate for the truncation method for the solution of a parabolic variational inequality (with A.E. Berger), *Math. of Comp.*, 31 (1977), 619-628.
12. Error estimates for the approximate identification of a constant coefficient from boundary flux data, *Numer. Funct. Anal. & Optimization*, 2(2 & 3) (1980), 121-153.
13. Error estimates for the approximation of an unknown constant coefficient in a partial differential equation, *MRC Technical Report 1902*.
14. Numerical approximation of a Cauchy problem for a parabolic partial differential equation (with R.E. Ewing), *Math. of Comp.*, 33 (1979), 1125-1144.

15. Error estimates for mixed methods (with J.E. Osborn), *R.A.I.R.O.*, 14 (1980), 249-277.
16. Error estimates for the numerical identification of a variable coefficient, *Math. of Comp.*, 40 (1983), 537-546.
17. On some ill-posed problems arising in glaciology (with R. Ewing), to appear in *Proc. of the Symp. on Ill-posed Problems: Theory & Practice*, Newark, Delaware, October, 1979.
18. Techniques for conductivity measurements in Antarctica (with R. Ewing, J. Bolzan, and I. Whillans), *Annals of Glaciology*, 3 (1982), 96-102.
19. Techniques and analysis for conductivity measurements in Antarctica (with R. Ewing, J. Bolzan, and I. Whillans), *Inst. of Polar Studies, Technical Report No. 74*, Ohio State University, Columbus, Ohio, 1981.
20. Two mixed finite element methods for the simply supported plate problem (with J.H. Bramble), *R.A.I.R.O.*, 17(4) (1983), 337-384.
21. Numerical identification of a variable coefficient, in *Methoden und Verfahren der Mathematischen Physik*, band 25 (1983), 31-42.
22. Approximation of an optimal control problem, in *Methoden und Verfahren der Mathematischen Physik*, band 25 (1983), 17-30.
23. A mixed-Lagrange multiplier finite element method for the polyharmonic equation (with J.H. Bramble), *R.A.I.R.O.*, 19 (1985), 519-557.
24. A numerical method for the Cauchy problem for Poisson's equation (with P. Monk), in *Advances in Computer Methods for Partial Differential Equations V*, R. Vichnevetsky and R.S. Stepleman (eds.), *Publ. IMACS* (1984), 350-352.
25. Logarithmic convexity for discrete harmonic functions and the approximation of the Cauchy problem for Poisson's equation (with P. Monk), *Math. of Comp.*, 47 (1986), 135-149.
26. An analysis of a finite element for hyperbolic equations (with G. Richter), in *Advances in Computer Methods for Partial Differential Equations V*, R. Vichnevetsky and R.S. Stepleman (eds.), *Publ. IMACS* (1984), 297-300.
27. Analysis of a continuous finite element scheme for hyperbolic equations (with G.R. Richter), *SIAM J. on Num. Anal.*, 24 (1987), 257-278.
28. Remarks on a continuous finite element scheme for hyperbolic equations (with G.R. Richter), *Numerical Analysis Proceedings, Guanajuato, Mexico*, J.P. Hennart (ed.), *Lecture Notes in Mathematics*, Springer-Verlag, 1230, 63-72.
29. Continuous dependence on the elastic coefficients for a class of anisotropic materials (with D.N. Arnold), *IMA Preprint series #165*, Univ. of Minnesota, July, 1985.
30. Well-posedness of the fundamental boundary value problems for constrained anisotropic elastic materials (with D.N. Arnold), *Archive for Rational Mechanics and Analysis*, 98 (1987), 143-165.
31. A new mixed formulation for elasticity (with D.N. Arnold), *Numer. Math.*, 53 (1988), 13-30.
32. Inverse and ill-posed problems in reservoir simulation (with R. Ewing and T. Lin), *Notes and Reports on Mathematics in Science and Engineering*, Academic Press, 4, *Inverse and Ill-posed Problems*, Engl and Groetsch (eds), Academic Press (1987),

- 483-497.
33. A uniformly accurate finite element method for the Reissner- Mindlin plate (with D.N. Arnold), *SIAM J. on Numer. Anal.*, 26 (1989), 1276-1290.
 34. Nonconforming finite elements for the Stokes problem (with M. Crouzeix), *Math. of Comp.*, 52 (1989), 437-456.
 35. Stability of a higher order Hood-Taylor method (with F. Brezzi), *SIAM J. on Numerical Analysis*, 28 (1991), 581-590.
 36. The boundary layer for the Reissner-Mindlin plate model, (with D. N. Arnold), *SIAM J. on Math. Anal.* 21 (1990), 281-312.
 37. Equivalence of finite element methods for problems in elasticity, (with M. Morley), *SIAM J. on Numer. Anal.*, 27 (1990), 1486-1505.
 38. Nonconforming finite element methods for the equations of linear elasticity, *Math. of Comp.*, 57 (1991), 529-550.
 39. Approximation of Inverse Problems, in *Inverse Problems in Partial Differential Equations*, D. Colton, R. Ewing, W. Rundell (eds.), SIAM, 1990, 7-16.
 40. Edge effects in the Reissner-Mindlin plate theory, (with D. N. Arnold), in *Analytical and Computational Models for Shells*, (A. K. Noor, T. Belytschko, J. Simo, eds.), American Society of Mechanical Engineers, New York, 1989, 71-90.
 41. Local error estimates for a finite element method for hyperbolic and convection-diffusion equations (with G. Richter), *SIAM J. on Numer. Anal.*, 29 (1992), 730-754.
 42. The approximation of hyperbolic and convection-diffusion equations by explicit finite element methods (with G. Richter) in “Computational Methods for Boundary and Interior Layers in Several Dimensions,” J. J. H. Miller (editor), Boole Press, Dublin, 1991, 27-50.
 43. Reduced continuity finite element methods for first order scalar hyperbolic equations, (with D-M. Cai) *RAIRO Modél. Math. Anal. Numér.*, 28 (1994), 667-698.
 44. Comments on mixed finite element methods for problems with rough coefficients, (with J. Osborn), in “Advances in Computer Methods for Partial Differential Equations – VII,” Proceedings of the 7th IMACS International Conference on Computer Methods for Partial Differential Equations, IMACS, June 23, 1992, 237-243.
 45. A finite element method for a minimum energy plate model, (with S. Alessandrini), in “Advances in Computer Methods for Partial Differential Equations – VII,” Proceedings of the 7th IMACS International Conference on Computer Methods for Partial Differential Equations, IMACS, June 23, 1992, 15-21.
 46. A finite element method for the approximation of the incompressible, linearized Euler equations, (with G. Richter), in “Advances in Computer Methods for Partial Differential Equations – VII,” Proceedings of the 7th IMACS International Conference on Computer Methods for Partial Differential Equations, IMACS, June 23, 1992, 244-250.
 47. Remarks on mixed finite element methods for problems with rough coefficients, (with J. Osborn) *Math. of Comp.*, 62 (1994), 1-19.
 48. Convergence of a second-order scheme for the nonlinear dynamical equations of elastic rods, (with J-M. Xu) *SIAM J. Numer. Anal.*, 32 (1995), 1185-1209.
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