Curriculum Vitae

Susanne C. Brenner

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Education

Ph.D.	The University of Michigan, 1988	(Mathematics)
M.S.	The University of Michigan, 1985	(Applied Mathematics)
M.A.	State University of New York at Stony Brook, 1982	(Mathematics)
	Universität Tübingen, 1980-1981	(Mathematics and German)
B.S.Ed.	West Chester State College, 1980	(Mathematics and German)

Employment

2006–present	Professor	Louisiana State University, Baton Rouge, LA
1999 - 2007	Professor	University of South Carolina, Columbia, SC
2005 - 2006	Associate Chair	Dept. of Mathematics, University of South Carolina
2002 - 2004	Assistant Chair	Dept. of Mathematics, University of South Carolina
1993 - 1999	Associate Professor	University of South Carolina, Columbia, SC
1990 - 1993	Assistant Professor	Clarkson University, Potsdam, NY
1988 - 1989	Teaching Postdoc	Syracuse University, Syracuse, NY

Visiting Positions

Institute for Mathematics and its Applications, Minneapolis, MN
Institute for Mathematics and its Applications, Minneapolis, MN
Mathematical Sciences Research Institute, Berkeley, CA
Universität Dortmund, Dortmund, Germany
Max-Planck Institute, Leipzig, Germany
Imperial College, London, UK
Université de Valenciennes, Valenciennes, France
Humboldt-Universität zu Berlin, Germany
Humboldt-Universität zu Berlin, Germany
Consiglio Nazionale delle Ricerche, Pavia, Italy

Member, Editorial Boards

- Mathematics of Computation, 1993–present (Editor, 2006–present)
- SIAM Journal on Numerical Analysis, 1997–2002, 2005–present
- Numerische Mathematik, 1998-present
- Electronic Transactions on Numerical Analysis, 2000–present
- Notices of the American Mathematical Society, 2001–present
- Applied Numerical Analysis and Computational Mathematics, 2003–present
- Journal of Numerical Analysis, Industrial and Applied Mathematics, 2006-present
- Journal of Computational and Applied Mathematics, Principal Editor, 2007-present

Professional Societies

- American Mathematical Society
- Association for Women in Mathematics
- Mathematical Association of America
- Society for Industrial and Applied Mathematics
- United States Association for Computational Mechanics
- Secretary, Society for the Foundations of Computational Mathematics, 1999–2002
- Member, Board of Directors, Society for the Foundations of Computational Mathematics
- Member, SIAM Coordinating Committee for the Joint Mathematics Meetings, 2004-2007
- Faculty Advisor, SIAM Student Chapter at the University of South Carolina
- Member, SIAM Best Paper Prizes Committee, 2007–2009

Awards and Honors

2005	Humboldt-Forschungspreis
2005	Who's Who in Computational Science and Engineering
2004	USC Educational Foundation Research Award in Science, Mathematics and Engineering
2004	West Chester University Distinguished Alumni Award
2002	Professeur Invité, Université de Valenciennes
2001	Woman in Residence, West Chester University
2001	EPSRC Visiting Fellow, Imperial College, London
2000	Gambrinus Fellow, Universität Dortmund
2000	Research Professor, Mathematical Sciences Research Institute, Berkeley

1998	London Mathematical Society Invited Lecturer (July) (Imperial College, University of Leeds, University of Loughborough)
1997	Visiting Scholar, Chinese University of Hong Kong (August 5–9)
1995	Support for Research Program, Institute for Advanced Study/Park City Mathematics Institute
1987 - 1988	Horace H. Rackham Predoctoral Fellowship, The University of Michigan
1986	Outstanding Teaching Award, The University of Michigan
1983	Chairman's Award for Excellence in Teaching by a First or Second Year Graduate Student, SUNY Stony Brook
1980 - 1981	German Academic Exchange Service (DAAD) Grant, Universität Tübingen
1980	Graduate summa cum laude, West Chester State College
1979	Charles S. Swope Memorial Scholarship, West Chester State College
1978	German Academic Exchange Service (DAAD) Scholarship, Schwäbisch Hall

Research Grants

- 1989–1992 Principal Investigator, National Science Foundation Grant, DMS-89-04911 and DMS-90-96126
- 1992–1996 Principal Investigator, National Science Foundation Grant, DMS-92-09332 and DMS-94-96275
- 1996–2000 Principal Investigator, National Science Foundation Grant, DMS-96-00133
- 2000–2003 Principal Investigator, National Science Foundation Grant, DMS-00-74246
- 2000–2003 Co-Principal Investigator, National Science Foundation Grant, DMS-00-79549 (SCREMS)
- 2003-2008 Principal Investigator, National Science Foundation Grant, DMS-03-11790
- 2007-2010 Principal Investigator, National Science Foundation Grant, DMS-07-13835

Graduate Students

- Doctoral Students: Qingmi He (2000), Jie Zhao (2004), Kening Wang (2006), Luke Owens (current), Jintao Cui (current)
- Master Student: Jun Han (2000)

Postdoctoral Advisee

- Fengyan Li (2004–2006)
- Thirupathi Gudi (2007–2009)

Member, National Review Panels

- NSF-CBMS Regional Research Conference Panel, June 1995, June 1999
- NSF Research Planning Grants and Career Advancement Awards for Women and Minorities Panel, April 1997
- NSF Group Infrastructure Grants Panel, April 1997
- NSF REU Sites Panel, December 1997, January 2000, January 2006
- AWM Travel Grants Selection Committee, February 1998, May 1998, February 1999
- DOE ASCI Site Visit Panel, October 1999
- NSF CAREER Panel, October 2001
- NSF Interdisciplinary Grants in the Mathematical Sciences Panel, March 2002, May 2003
- NSF-DUE Course Curriculum and Laboratory Improvement Panel, July 2002
- NSF Research Training Group Panel, January 2006
- DOE SciDAC Panel, April 2006

Reviewer

National Science Foundation, Division of Mathematical Sciences:

- Applied Mathematics
- Visiting Professorships for Women
- Research Experiences for Undergraduates
- Research Planning Grants and Career
 - Advancement Awards for Women and Minorities
- Collaborations in Mathematical Geosciences

National Science Foundation, Biomedical Engineering Program

National Science Foundation, Division of Undergraduate Education

Department of Energy, Mathematical, Information, and Computational Sciences Division

Nederlandse Organisatie voor Wetenschappelijk Onderzoek

Fundação para a Ciência e a Tecnologia

Deutsche Forschungsgemeinschaft

International Ph.D. External Examiner

- Department of Mathematics, University of Jyväskylä, Finland, 2004.
- Department of Mathematics, Indian Institute of Technology, Bombay, 2006.

- Computational Mathematics
- Group Infrastructure Grants
- Infrastructure Program
- International Programs
- Information Technology Research

Referee

- Advances in Computational Mathematics
- Applied Mathematics Letters
- Applied Numerical Mathematics
- BIT
- Computational and Applied Mathematics
- Computer Methods in Applied Mechanics and Engineering
- Constructive Approximation
- Electronic Transactions on Numerical Analysis
- IMA Journal on Numerical Analysis
- Journal of Computational Mathematics
- Journal of the American Mathematical Society
- Journal of Computational Physics
- Journal of Scientific Computing
- Mathematics of Computation
- Numerical Algorithms
- Numerical Linear Algebra With Applications
- Numerical Methods for Partial Differential Equations
- RAIRO Mathematical Modelling and Numerical Analysis
- SIAM Journal on Applied Mathematics
- SIAM Journal on Numerical Analysis
- SIAM Journal on Scientific Computing
- SIAM Review
- Proceedings of the conference "Mathematics of Computation 1943-1993"
- Proceedings of the 4th, 5th and 7th Copper Mountain Conferences on Multigrid Methods
- Proceedings of the Tenth Domain Decomposition Methods Conference

Conference Organization

Scientific Committees

- $\bullet~{\rm Com^2MaC}$ Conference on Computational Mathematics, South Korea, July 2001
- Fifth International Conference on Large Scale Scientific Computations, Bulgaria, June 2005
- Twelfth Copper Mountain Conference on Multigrid Methods, USA, April 2005
- International Conference of Numerical Analysis and Applied Mathematics 2005 (ICNAAM 2005), Rhodes, Greece, September 2005

- International Conference on Partial Differential Equations and Numerical Analysis, Changsha, People's Republic of China, June 2006
- International Conference of Numerical Analysis and Applied Mathematics 2006 (IC-NAAM 2006), Hersonnisos, Crete, Greece, September, 2006
- Eighth IMACS International Symposium on Iterative Methods in Scientific Computation, College Station, USA, November 2006
- Thirteenth Copper Mountain Conference on Multigrid Methods, USA, April 2007
- Fifth Singular Days, Luminy, France, April 2007
- International Conference of Numerical Analysis and Applied Mathematics 2007 (ICNAAM 2007), Corfu, Greece, September 2007

Organizing Committees

- 16th International Conference on Domain Decomposition Methods, New York, January 2005
- Nonstandard Finite Element Methods, Oberwolfach, Germany, August 2008.

Mini-Symposia/Mini-Workshops/Special Sessions

- Invited Mini-Symposium: Finite Element Methods in Mechanics, SIAM Annual Meeting, Charlotte, NC, October 1995
- Invited Mini-Symposium: Finite Element Methods in Mechanics, SIAM Annual Meeting, Atlanta, GA, May 1999
- Invited Special Session: Numerical Solutions of PDEs (with Jun Zhou), AMS-HKMS Joint Meeting, Hong Kong, December 2000
- Invited Special Session: Numerical Methods for PDEs (with Craig C. Douglas), AMS Southeastern Section Meeting, Chattanooga, TN, October 2001
- Invited Mini-Symposium: Mathematical Foundations of Computational Mechanics (with Carsten Carstensen), Fifth World Congress on Computational Mechanics, Vienna, Austria, July 2002
- Mini-Workshop: Analytical and Numerical Treatment of Singularities in PDE (with Monique Dauge and Anna-Margarete Sändig), Oberwolfach, Germany, November 2002
- Invited Mini-Symposium: Nonconforming Methods: Classical, Mortar and Discontinuous Galerkin, ECCOMAS 2004, Jyväskylä, Finland, July 2004
- Invited Mini-Symposium: Treatment of Singularities, Sixth World Congress on Computational Mechanics, Beijing, PRC, September 2004.
- Invited Mini-Symposium (in honor of Ivo Babuška's eightieth birthday): Advances in the Mathematics of Finite Elements (with Richard Falk), Eighth U.S. Congress for Computational Mechanics, Austin, Texas, July 2005.
- Mini-Symposium: Discontinuous Galerkin Methods (with Fengyan Li), SIAM-SEAS 2005, Charleston, March 25–26, 2005.
- Mini-Symposium: Regional Student Chapter Talks (with Li-yeng Sung), SIAM-SEAS 2005, Charleston, March 25–26, 2005.

- Mini-Symposium: Advances in Computational Mechanics (with Carsten Carstensen), Fifth International Conference on Large Scale Scientific Computations (LSSC'05), Sozopol, Bulgaria, June 5-10, 2005.
- Mini-Symposium: Computational Methods for Electromagnetism (with Fengyan Li), MAA-SIAM-SEAS 2006, Auburn, March 31–April, 2006.
- Invited Mini-Symposium: Numerical PDEs (with Ronald Hoppe), International Conference of Numerical Analysis and Applied Mathematics (ICNAAM 2006), Hersonnisos, Crete, Greece, September 15–19, 2006

Finite Element Circus, University of South Carolina, April 1996

Finite Element Circus and Finite Element Rodeo, Louisiana State University, March 2007

Publications

Monograph

S.C. Brenner and L.R. Scott, *The Mathematical Theory of Finite Element Methods*, Texts in Applied Mathematics, v. 15, Springer–Verlag, New York

- First edition, 1994 Second corrected printing, 1996
- Third printing, 1998
- Second edition, 2002 Second printing, 2004
- Third printing, 2005
- Reprinted by Beijing World Publishing, 1998

Refereed Articles

In Print

- 1. S.C. Brenner, An optimal order multigrid method for P1 nonconforming finite elements, Mathematics of Computation 52 (1989), 1–15.
- 2. S.C. Brenner, An optimal order nonconforming multigrid method for the biharmonic equation, SIAM Journal on Numerical Analysis **26** (1989), 1124–1138.
- S.C. Brenner, Multigrid methods for nonconforming finite elements, in the (refereed) Proceedings of the Fourth Copper Mountain Conference on Multigrid Methods, J. Mandel, et.al., ed., Society for Industrial and Applied Mathematics, Philadelphia, 1989, pp. 54–65.
- 4. S.C. Brenner, A nonconforming multigrid method for the stationary Stokes equations, Mathematics of Computation 55 (1990), 411–437.
- 5. S.C. Brenner, A multigrid method for the lowest order Raviart-Thomas mixed triangular finite element, SIAM Journal on Numerical Analysis **29** (1992), 647–678.
- 6. S.C. Brenner and L.-Y. Sung, *Linear finite element methods for planar linear elasticity*, Mathematics of Computation **59** (1992), 321–338.
- 7. S.C. Brenner, A nonconforming multigrid method for the pure displacement problem in planar linear elasticity, SIAM Journal on Numerical Analysis **30** (1993), 116–135.
- 8a. S.C. Brenner, A nonconforming multigrid method for the pure traction problem in planar linear elasticity, Mathematics of Computation **63** (1994), 435–460.

- 8b. S.C. Brenner, Supplement to A nonconforming multigrid method for the pure traction problem in planar linear elasticity, Mathematics of Computation 63 (1994), S1–S5.
- S.C. Brenner, Two-level additive Schwarz preconditioners for nonconforming finite elements, in Domain Decomposition Methods in Scientific and Engineering Computing, Contemporary Mathematics, v. 180, D.E. Keyes and J. Xu, ed., American Mathematical Society, Providence, 1994, pp. 9–14.
- 10. S.C. Brenner, A two-level additive Schwarz preconditioner for two-dimensional stationary Stokes equations, Advances in Computational Mathematics 4 (1995), 111–126.
- 11. S.C. Brenner, A two-level additive Schwarz preconditioner for macro-element approximations of the plate bending problem, Houston Journal of Mathematics **21** (1995), 823–844.
- 12. S.C. Brenner, A two-level additive Schwarz preconditioner for nonconforming plate elements, Numerische Mathematik **72** (1996), 419–447.
- 13. S.C. Brenner, *Multigrid methods for parameter dependent problems*, RAIRO Mathematical Modelling and Numerical Analysis **30** (1996), 265–297.
- 14. S.C. Brenner, Two-level additive Schwarz preconditioners for nonconforming finite element methods, Mathematics of Computation 65 (1996), 897–921.
- 15. S.C. Brenner, *Preconditioning complicated finite elements by simple finite elements*, SIAM Journal on Scientific Computation **17** (1996), 1269–1274.
- 16. S.C. Brenner, *Two-level additive Schwarz preconditioners for plate elements*, Wuhan University Journal of Natural Sciences **1** (1996), 658–667.
- 17. S.C. Brenner and L.-Y. Sung, Multigrid methods for the computation of singular solutions and stress intensity factors II: Crack singularities, BIT **37** (1997), 623–643.
- S.C. Brenner, Overcoming singularities by multigrid methods, SIAM Journal on Numerical Analysis 35 (1998), 1883–1892.
- S.C. Brenner and L.-Y. Sung, Lower bounds for two-Level additive Schwarz preconditioners for nonconforming finite elements, Advances in Computational Mathematics, Z. Chen et al., ed., Lecture Notes in Pure and Applied Mathematics 202, Marcel Dekker, 1998, pp. 585–604.
- 20. S.C. Brenner, Convergence of nonconforming multigrid methods without full elliptic regularity, Mathematics of Computation 68 (1999), 25–53.
- S.C. Brenner, Multigrid methods for the computation of singular solutions and stress intensity factors I: Corner singularities, Mathematics of Computation 68 (1999), 559– 583.
- 22. S.C. Brenner, A nonstandard finite element interpolation estimate, Numerical Functional Analysis and Optimization **20** (1999), 245–250.
- 23. S.C. Brenner and L.-Y. Sung, *Balancing domain decomposition for nonconforming plate elements*, Numerische Mathematik **83** (1999), 25–52.
- 24. S.C. Brenner, The condition number of the Schur complement in domain decomposition, Numerische Mathematik 83 (1999), 187–203.

- 25. S.C. Brenner, Lower bounds for two-level additive Schwarz preconditioners with small overlap, SIAM Journal on Scientific Computation **21** (2000), 1657–1669.
- S.C. Brenner and L.-Y. Sung, Lower bounds for nonoverlapping domain decomposition preconditioners in two dimensions, Mathematics of Computation 69 (2000), 1319– 1339.
- 27. S.C. Brenner and L.-Y. Sung, Discrete Sobolev and Poincaré inequalities via Fourier series, East-West Journal of Numerical Mathematics 8 (2000), 83–92.
- F. Ben Belgacem and S.C. Brenner, Some nonstandard finite element estimates with applications to 3D Poisson and Signorini problems, Electronic Transactions on Numerical Analysis (ETNA) 12 (2001), 134–148.
- S.C. Brenner, A new look at FETI, Proceedings of the Thirteenth International Conference on Domain Decomposition Methods, N. Debit, M. Garbey, R. Hoppe, J. Périaux, D. Keyes and Y. Kuznetsov, ed., DDM.org, 2001, pp. 41–51.
- 30. S.C. Brenner, Convergence of the multigrid V-cycle algorithm for second order boundary value problems without full elliptic regularity, Mathematics of Computation 71 (2002), 507–525.
- 31. S.C. Brenner, Smoothers, mesh dependent norms, interpolation and multigrid, Applied Numerical Mathematics **43** (2002), 45–56.
- 32. S.C. Brenner and Q. He, Lower bounds for three-dimensional nonoverlapping domain decomposition algorithms, Numerische Mathematik **93** (2003), 445–470.
- S.C. Brenner, An additive Schwarz preconditioner for the FETI method, Numerische Mathematik 94 (2003), 1–31.
- 34. S.C. Brenner, *Poincaré-Friedrichs inequalities for piecewise* H¹ functions, SIAM Journal on Numerical Analysis **41** (2003), 306–324.
- 35. S.C. Brenner and L.-Y. Sung, Multigrid methods for the computation of singular solutions and stress intensity factors III: Interface singularities, Computer Methods in Applied Mechanics and Engineering **192** (2003), 4687–4702.
- S.C. Brenner, Analysis of two-dimensional FETI-DP preconditioners by the standard additive Schwarz framework, Electronic Transactions on Numerical Analysis (ETNA) 16 (2003), 165–185.
- S.C. Brenner, Convergence of nonconforming V-cycle and F-cycle multigrid algorithms for second order elliptic boundary value problems, Mathematics of Computation 73 (2004), 1041–1066.
- 38. S.C. Brenner, Korn's inequalities for piecewise H¹ vector fields, Mathematics of Computation **73** (2004), 1067–1087.
- 39. S.C. Brenner, Discrete Sobolev and Poincaré inequalities for piecewise polynomial functions, Electronic Transactions on Numerical Analysis (ETNA) 18 (2004), 42–48.
- S.C. Brenner, K. Wang and J. Zhao, *Poincaré-Friedrichs inequalities for piecewise H² functions*, Numerical Functional Analysis and Optimization 25 (2004), 463–478.

- S.C. Brenner and L.-Y. Sung, C⁰ interior penalty methods for fourth order elliptic boundary value problems on polygonal domains, Journal of Scientific Computing 22/23 (2005), 83–118.
- S.C. Brenner and J. Zhao, Convergence of multigrid algorithms for interior penalty methods, Applied Numerical Analysis and Computational Mathematics 2 (2005), 3– 18.
- 43. S.C. Brenner and K. Wang, Two-level additive Schwarz preconditioners for C^0 interior penalty methods, Numerische Mathematik **102** (2005), 231–255.
- 44. S.C. Brenner and L.-Y. Sung, *Multigrid algorithms for* C^0 *interior penalty methods*, SIAM Journal on Numerical Analysis 44 (2006), 199–223.
- 45. S.C. Brenner and L.-Y. Sung, New smoothers for the Stokes problem, Oberwolfach Report Vol. 2 (2005), European Mathematical Society Publishing House, pp. 1338– 1341.
- 46. S.C. Brenner, Lower bounds in domain decomposition, Domain Decomposition Methods in Science and Engineering XVI, O.B. Widlund and D.E. Keyes, ed., Springer-Verlag, Berlin-Heidelberg, 2007, pp. 27–39.
- 47. S.C. Brenner and L.-Y. Sung, *BDDC and FETI-DP without matrices or vectors*, Computer Methods in Applied Mechanics and Engineering **196** (2007), 1429–1435.
- S.C. Brenner, F. Li and L.-Y. Sung, A locally divergence-free nonconforming finite element method for the time-harmonic Maxwell equations, Mathematics of Computation 76 (2007), 573–595.
- S.C. Brenner and L. Owens, A weakly over-penalized non-symmetric interior penalty method, Journal of Numerical Analysis, Industrial and Applied Mathematics. 2 (2007), 35–48.
- 50. S.C. Brenner and L. Owens, A W-cycle algorithm for a weakly over-penalized interior penalty method, Computer Methods in Applied Mechanics and Engineering **196** (2007), 3823–3832.

In Press

51. S.C. Brenner, F. Li and L.-Y. Sung, A locally divergence-free interior penalty method for two-dimensional curl-curl problems, to appear in SIAM Journal on Numerical Analysis

Submitted for Publication

- 52. S.C. Brenner, J. Cui, F. Li and L.-Y. Sung, A nonconforming finite element method for a two-dimensional curl-curl and grad-div problem
- 53. S.C. Brenner, F. Li and L.-Y. Sung, A nonconforming penalty method for a twodimensional curl-curl problem
- 54. S.C. Brenner, L. Owens and L.-Y. Sung, A weakly over-penalized symmetric interior penalty method

Chapter in Book

S.C. Brenner and C. Carstensen, *Finite Element Methods*, in *Encyclopedia of Computational Mechanics*, pages 73–118, E. Stein, R. de Borst and T.J.R. Hughes, eds., Wiley, Weinheim, 2004.

Book Review

Finite Element Methods: Fifty Years of the Courant Element, M. Křížek, P. Neittaanmäki and R. Stenberg, eds., Mathematics of Computation **65** (1996), 1365.

Research Presentations

Plenary Talks

- A New Look at FETI, 13th International Conference on Domain Decomposition Methods, Lyon, France, October 9–12, 2000
- Additive Multigrid Theory, 19th Biennial Conference on Numerical Analysis, Dundee, Scotland, June 26–29, 2001
- Additive Multigrid Theory, Numerical Analysis Section Plenary Talk, 15 ÖMG-Kongress Jahrestagung der Deutschen Mathematikervereinigung, Vienna, Austria, September 16–22, 2001 (trip cancelled due to the events on September 11)
- Additive Multigrid Theory, AMS Invited Speaker, Chattanooga, Tennessee, October 5–6, 2001
- Multigrid Methods for Singular Solutions and Stress Intensity Factors, Southeast Conference on Applied Mathematics (SECAM), Raleigh, North Carolina, November 9–11, 2001
- Multigrid and Domain Decomposition Algorithms for C⁰ Interior Penalty Methods, International Conference of Numerical Analysis and Applied Mathematics 2004 (IC-NAAM 2004), Chalkis, Greece, September 10–14, 2004
- Lower Bounds in Domain Decomposition, 16th International Conference on Domain Decomposition Methods, New York, January 12–15, 2005
- Additive Multigrid Theory, Fifth International Conference on Large Scale Scientific Computations (LSSC'05), Sozopol, Bulgaria, June 5-10, 2005
- Multigrid and Domain Decomposition Algorithms for C⁰ Interior Penalty Methods, The Fourth International Workshop on Scientific Computing and Its Applications, Shanghai, China, June 20–23, 2005
- Fast Solvers for C⁰ Interior Penalty Methods, MAA-SIAM Southeast Atlantic Section Meeting, Auburn, Alabama, March 31–April 1, 2006
- Fast Solvers for C⁰ Interior Penalty Methods, Numerical PDEs in the 21st Century: Can You Teach New Tricks to an Old Dog?, Santa Fe, NM, April 20–22, 2006
- A Nonconforming Method for the Time-Harmonic Maxwell's Equations, International Conference on Partial Differential Equations and Numerical Analysis, Changsha, Hunan, China, June 22–26, 2006

- *TBA*, The 14th Biennial Computational Techniques and Applications Conference, Australian National University, Canberra, ACT, Australia, 13-16th July 2008
- *TBA*, Fast Algorithms for Scientific Computing, A Symposium in Honor of Olof B. Widlund on the Occasion of His 70th Birthday, Courant Institute, New York University, New York City, September 19-20, 2008

Semi-Plenary Talks

 C⁰ Interior Penalty Methods for Fourth Order Problems, Modern Computational Methods in Applied Mathematics (MCM 2004), Będlewo, Poznań, Poland, June 14– 19, 2004

Short Course

• Principal lecturer, *Mixed Finite Element Technologies*, International Centre For Mechanical Sciences, Udine, Italy, September 26–30, 2005

Presentations at Mathematisches Forschungsinstitut Oberwolfach

- Multigrid Methods for Parameter Dependent Problems, Numerical Methods in Computational Mechanics, January 31–February 6, 1993
- Convergence of Nonconforming or Nonnested Multigrid Methods without Full Elliptic Regularity, Multilevel Methods and Applications, April 30–May 6, 1995
- Lower Bounds in Domain Decomposition, Domain Decomposition and Multifield Theories, April 27–May 1, 1998
- *Multigrid Methods for Interface Problems*, Schnelle Löser für partielle Differentialgleichungen, May 30–June 5, 1999
- An Additive Theory for Multigrid V-cycle Algorithms, Schnelle Löser für partielle Differentialgleichungen, May 27–June 2, 2001
- Multigrid Methods for Stress Intensity Factors and Singular Solutions, Mini-Workshop: Analytical and Numerical Treatment of Singularities in PDE, November 4–8, 2002
- Multigrid Methods for C⁰ Interior Penalty Methods, Schnelle Löser für partielle Differentialgleichungen, June 1–6, 2003
- New Smoothers for the Stokes Problem, Schnelle Löser für partielle Differentialgleichungen, May 22–28, 2005

Invited Conference Talks

- Multigrid Methods for Some Nonconforming Finite Elements, Fourth Copper Mountain Conference on Multigrid Methods, Copper Mountain, Colorado, April 9–13, 1989
- Nonconforming Multigrid Methods, Mini-symposium on Nonconforming and Nonnested Multigrid Methods, SIAM summer meeting, San Diego, California, July 17–21, 1989
- A Two-level Additive Schwarz Preconditioner for Macro-element Approximations of the Plate Bending Problem, Session on Mixed and Finite Element Methods, 14th

World Congress of the International Association for Mathematics and Computers in Simulation (IMACS), Atlanta, Georgia, July 11–15, 1994

- Two-level Additive Schwarz Preconditioners for Some Plate Elements, International Workshop on Multilevel Methods, Meisdorf, Germany, September 26–28, 1994
- Two-level Additive Schwarz Preconditioners for Plate Elements, International Conference on Parallel Algorithms 1995 (ICPA'95), Wuhan, China, October 15–19, 1995
- Multigrid Methods for Stress Intensity Factors, Workshop on Iterative Methods, International Linear Algebra Year, CERFACS (Centre Européen de Recherche et de Formation Avancée en Calcul Scientifique), Toulouse, France, June 10–13, 1996
- Multigrid Methods for Stress Intensity Factors and Singular Solutions, Approximation and PDEs, Foundations of Computational Mathematics, Rio de Janeiro, Brazil, January 5–12, 1997
- Domain Decomposition for Nonconforming Plate Elements, Workshop on the Parallel Solution of PDE, Institute for Mathematics and its Applications, University of Minnesota, Minneapolis, Minnesota, June 9–13, 1997
- Multigrid Methods for Stress Intensity Factors and Singular Solutions, Third IMACS International Symposium on Iterative Methods in Scientific Computation, Jackson Hole, Wyoming, July 9–12, 1997
- Multigrid Methods for Stress Intensity Factors and Singular Solutions, Guangzhou International Symposium on Computational Mathematics, Zhongshan University, Guangzhou, China, August 11–15, 1997 (NSF Supported Speaker)
- Multigrid Methods for Stress Intensity Factors and Singular Solutions, Innovative Finite Element Computations in Continuum Mechanics, 15th IMACS World Congress, Berlin, Germany, August 24–29, 1997
- Multigrid Methods for Interface Problems, Treatment of Singularities, p-FEM 2000, Conference in Honor of Barna Szabò's 60th Birthday, St. Louis, Missouri, May 31– June 2, 2000
- An Additive Theory for V-cycle Multigrid Algorithms, Simulation Techniques for Fluid and Structural Mechanics, Universität Dortmund, Germany, September 22-23, 2000
- Multigrid Methods for Two-Dimensional Interface Problems, Session on the Numerical Solution of PDEs, Joint AMS-HKMS Meeting, Hong Kong, December 13–16, 2000
- Multigrid Methods for Two-Dimensional Interface Problems, Fifth World Congress on Computational Mechanics, Vienna, Austria, July 2002
- Additive Multigrid Theory, Workshop on Foundations of Numerical Algorithms for PDEs, Foundations of Computational Mathematics (FoCM) Conference, University of Minnesota, Minneapolis, Minnesota, August 5–7, 2002
- Discontinuous Versions of Some Classical Inequalities, ETNA's Tenth Anniversary Conference, Kent, Ohio, May 29–31, 2003

- Multigrid Methods for Stress Intensity Factors and Singular Solutions, Minisymposium: Boundary Value Problems with Boundary Singularities and Related Methods, The Fifth International Congress on Industrial and Applied Mathematics, Sydney, Australia, July 7–11, 2003
- Discontinuous Versions of Some Classical Inequalities, Minisymposium: Discontinuous Galerkin Method and its Applications, The Fifth International Congress on Industrial and Applied Mathematics, Sydney, Australia, July 7–11, 2003
- Multigrid Methods for C⁰ Interior Penalty Methods, Recent Advances and State-ofthe-Art in Discontinuous Galerkin Methods in Computational Structural Mechanics, Army High Performance Computing Research Center, Minneapolis, October 28–29, 2003
- Multigrid Algorithms for C⁰ Interior Penalty Methods, Computational Methods in Multiscale Analysis and Applications, University of Florida, Gainesville, February 29–March 2, 2004
- Fast Solvers for C⁰ Interior Penalty Methods, United States National Congress on Computational Mechanics (USNCCM 2005), Austin, Texas, July 25–27, 2005
- Multigrid and Domain Decomposition for C⁰ Interior Penalty Methods, Minisymposium: Scientific Computing, 16th Internationaler Kongress der ÖMG/DMV, Mathematik 2005, Klagenfurt, Austria, September 18–23, 2005
- Fast Solvers for C⁰ Interior Penalty Methods, MATHEON Workshop on Computational Partial Differential Equations, Berlin, Germany, February 2, 2006
- A Functional Analytic Framework for BDDC and FETI-DP, Mini-Symposium, 17th International Conference on Domain Decomposition Methods, St. Wolfgang/Strobl, Austria, July 3–7, 2006
- A W-Cycle Multigrid Algorithm for a New NIPG Multigrid Method, Mini-Symposium on Numerical PDEs, International Conference of Numerical Analysis and Applied Mathematics 2006 (ICNAAM 2006), Hersonnisos, Crete, Greece, September 15–19, 2006
- Nonconforming Methods for Electromagnetics, Third Workshop on Numerical Methods for Evolution Equations, Heraklion, Crete, Greece, September 22-23, 2006
- Multigrid Algorithms for Some New Interior Penalty Methods, Eighth IMACS International Symposium on Iterative Methods in Scientific Computation, Texas A& M University, College Station, TX, November 14–17, 2006
- Multigrid Algorithms for Some New Interior Penalty Methods, Minisymposium: Discontinuous Galerkin Methods, The Sixth International Congress on Industrial and Applied Mathematics, Zurich, Switzerland, July 16–20, 2007

Colloquia and Invited Seminar Talks

- Multigrid Methods for Nonconforming Finite Elements, SUNY at Potsdam, March 1988
- Multigrid Methods for Nonconforming Finite Elements, St. Lawrence University, March 30, 1988
- Multigrid Methods for Nonconforming Finite Elements, Clarkson University, November 21, 1988
- Multigrid for Nonconforming Finite Element Methods, Chinese University of Hong Kong, June 25, 1992
- Multigrid Methods for Parameter Dependent Problems, University of South Carolina, May 14, 1993
- Multigrid Methods for Parameter Dependent Problems, University of Colorado at Denver, March 10, 1994
- Multigrid Methods for Nonconforming Finite Elements, Otto-von-Guericke Universität, Magdeburg, Germany, September 29, 1994
- Multigrid Methods for Stress Intensity Factors and Singular Solutions, University of Colorado at Denver, November 4, 1996
- Multigrid Methods for Stress Intensity Factors and Singular Solutions, Numerical Analysis Seminar, University of Minnesota, February 6, 1997
- Multigrid Methods for Stress Intensity Factors and Singular Solutions, TICAM Seminar, University of Texas at Austin, February 20, 1997
- Nonconforming Finite Elements, IMA Postdoc Seminar, Institute for Mathematics and its Applications, University of Minnesota, March 11, 1997
- Multigrid Methods for Stress Intensity Factors and Singular Solutions, Virginia Tech University March 28, 1997
- Multigrid Methods for Stress Intensity Factors and Singular Solutions, Applied Math Seminar, Duke University, February 23, 1998
- Multigrid Methods for Stress Intensity Factors and Singular Solutions, Scientific Computation Seminar, University of Houston, May 8, 1998
- Multigrid Methods for Stress Intensity Factors and Singular Solutions, Imperial College, University of London, July 14, 1998
- Multigrid Methods for Stress Intensity Factors and Singular Solutions, University of Leeds, July 16, 1998
- Multigrid Methods for Stress Intensity Factors and Singular Solutions, University of Loughborough, July 17, 1998
- Multigrid Methods for Stress Intensity Factors and Singular Solutions: An Application of Superconvergence, Superconvergence Workshop, MSRI, Berkeley, CA, March 20–31, 2000
- Multigrid Methods for Nonconforming Finite Elements I, Universität Dortmund, September 11, 2000

- Multigrid Methods for Nonconforming Finite Elements II, Universität Dortmund, September 12, 2000
- Iterationen: Von Newton ins Teraflop-Zeitalter, Gambrinus Lecture, Universität Dortmund, October 4, 2000
- An Additive Theory for Multigrid V-cycle Algorithms, University of Warsaw, October 26, 2000
- An Additive Theory for Multigrid V-cycle Algorithms, Universität Leipzig, October 31, 2000
- Multigrid Methods for Stress Intensity Factors and Singular Solutions, The University of Reading, February 16, 2001
- What is a Finite Element?, West Chester University, March 28, 2001
- Iterations: from Newton to Teraflops Computing, West Chester University, March 29, 2001
- Multigrid Methods for Stress Intensity Factors and Singular Solutions, Imperial College, May 4, 2001
- Multigrid Methods for Stress Intensity Factors and Singular Solutions, Johns Hopkins University, November 12, 2001
- Additive Multigrid Theory, University of Minnesota, January 31, 2002
- Multigrid Methods for Stress Intensity Factors and Singular Solutions, Clemson University, March 13, 2003
- Additive Multigrid Theory, Illinois Institute of Technology, January 30, 2004
- Discontinuous Versions of Some Classical Inequalities, University of Houston, February 5, 2004
- Additive Multigrid Theory, University of Houston, April 2, 2004
- Discontinuous Versions of Some Classical Inequalities, University of Maryland at Baltimore County, May 7, 2004
- Discontinuous Versions of Some Classical Inequalities, Humboldt-Universität zu Berlin, June 25, 2004
- Additive Multigrid Theory, Institute of Computational Mathematics, Chinese Academy of Science, Beijing, September 7, 2004
- Additive Multigrid Theory, Louisiana State University, February 18, 2005
- Fast Solvers for C⁰ Interior Penalty Methods, Louisiana State University, March 24, 2006
- Fast Solvers for C^0 Interior Penalty Methods, University of Maryland, April 4, 2006
- A Nonconforming Method for the Time-Harmonic Maxwell Equations, Oberseminar, Freie Universität Berlin, Berlin, Germany, May 12, 2006
- Fast Solvers for C⁰ Interior Penalty Methods, Hunan Normal University, Changsha, China, June 20, 2006

- Fast Solvers for C⁰ Interior Penalty Methods, Hunan University, Changsha, China, June 21, 2006
- Fast Solvers for C⁰ Interior Penalty Methods, Xiangtan University, Xiangtan, China, June 22, 2006
- A Nonconforming Method for the Time-Harmonic Maxwell Equations, Universität Augsburg, Augsburg, Germany, July 28, 2006
- Fast Solvers for C⁰ Interior Penalty Methods, Georgia Tech University, Atlanta, GA, October 11, 2006
- Additive Multigrid Theory, Emory University, Atlanta, GA, October 11, 2006
- A Nonconforming Method for the Time-Harmonic Maxwell Equations, McGill University, Montreal, Canada, November 27, 2006
- Nonconforming Methods for Electromagnetics, Oberseminar, Max-Plank Institute, Leipzig, Germany, June 20, 2007
- Nonconforming Methods for Electromagnetics, Consiglio Nazionale delle Ricerche, Pavia, Italy, July 3, 2007
- Nonconforming Methods for Electromagnetics, Colorado State University, Fort Collins, Colorado, September 28, 2007

Contributed Conference and Seminar Talks

- Multigrid Techniques for Nonconforming Finite Element Methods, Three Rivers Applied Math Colloquium, Pittsburgh, Pennsylvania, April 9–10, 1988
- Multigrid Methods for Nonconforming Finite Elements, Finite Element Circus, University of Maryland at College Park, May 6–7, 1988
- Multigrid Methods for Finite Elements I, Applied Mathematics Seminar, Syracuse University, November 18, 1988
- Multigrid Methods for Finite Elements II, Applied Mathematics Seminar, Syracuse University, November 30, 1988
- Multigrid Methods for Finite Elements III, Applied Mathematics Seminar, Syracuse University, December 7, 1988
- A Nonconforming Multigrid Method for the Stationary Stokes Equations, Finite Element Circus, Purdue University, March 31 – April 1, 1989
- A Multigrid Algorithm for the Lowest Order Raviart-Thomas Mixed Triangular Finite Element Method, Finite Element Circus, Cornell University, April 20-21, 1990
- A Multigrid Algorithm for the Lowest Order Raviart-Thomas Mixed Triangular Finite Element Method, Third European Conference on Multigrid Methods, Bonn, Germany, October 1-5, 1990
- Linear Finite Elements for Linear Elasticity, Workshop on Mathematics of Computation in Partial Differential Equations (Conference in honor of Jim Bramble's 60th Birthday), Cornell University, January 25-27, 1991

- Multigrid Methods for 2D Linear Elasticity, Fifth Copper Mountain Conference on Multigrid Methods, Copper Mountain, Colorado, March 31–April 5, 1991
- A Nonconforming Mixed Multigrid Method for the Pure Traction Problem in Planar Linear Elasticity, Finite Element Circus, U.S. Naval Academy, Annapolis, Maryland, March 27-28, 1992
- Multigrid Methods for Parameter Dependent Problems, Sixth Copper Mountain Conference on Multigrid Methods, Copper Mountain, Colorado, April 4–9, 1993
- Two-level Additive Schwarz Preconditioners for Nonconforming Finite Elements, Seventh International Conference on Domain Decomposition Methods, Penn State University, October 27-30, 1993
- Two-level Additive Schwarz Preconditioners for Nonconforming Finite Elements, Finite Element Circus, Cornell University, November 11-12, 1993
- The Mixed Finite Element Method I, PICS (Partnership in Computational Science) Seminar, University of South Carolina, April 27, 1994
- The Mixed Finite Element Method II, PICS Seminar, University of South Carolina, May 4, 1994
- Preconditioning Complicated FEMs by Simple FEMs, Finite Element Circus, The Pennsylvania State University, November 11–12, 1994
- Convergence of Nonconforming or Nonnested Multigrid Methods without Full Elliptic Regularity, Seventh Copper Mountain Conference on Multigrid Methods, Copper Mountain, Colorado, April 3–7, 1995
- Overcoming Singularities by Multigrid: Multigrid Theory, Applied Math Seminar, University of South Carolina, October 4, 1996
- Overcoming Singularities by Multigrid, Finite Element Circus, University of Tennessee at Knoxville, October 18–19, 1996
- Multigrid Methods for Stress Intensity Factors and Singular Solutions, Eighth Copper Mountain Conference on Multigrid Methods, Copper Mountain, CO, April 6–11, 1997
- Lower Bounds for Two-Level Additive Schwarz Preconditioners with Small Overlap, Finite Element Circus, University of Colorado at Denver, March 27–28, 1998
- Lower Bounds for Two-Level Additive Schwarz Preconditioners with Small Overlap, Fifth Copper Mountain Conference on Iterative Methods, Copper Mountain, CO, March 30–April 3, 1998
- Lower Bounds in Domain Decomposition, Applied Mathematics Seminar, University of South Carolina, April 14, 1998
- Lower Bounds for Nonoverlapping Domain Decomposition Methods, Ninth Copper Mountain Conference on Multigrid Methods, Copper Mountain, CO, April 12–16, 1999
- Neumann-Neumann Preconditioners, Numerical PDE Seminar, University of South Carolina, September 7, 1999
- Neumann-Neumann Preconditioners, Numerical PDE Seminar, University of South Carolina, September 14, 1999

- An Additive Convergence Theory for the Multigrid V-Cycle Algorithm Finite Element Circus, University of Texas at Austin, February 25–26, 2000
- An Additive Theory for Multigrid V-cycle Algorithms, Tenth Copper Mountain Conference on Multigrid Methods, Copper Mountain, CO, April 1–6, 2001
- Discontinuous Versions of Some Classical Inequalities, Numerical PDE Seminar, University of South Carolina, April 26, 2002
- Discontinuous Versions of Some Classical Inequalities, Finite Element Circus, Cornell University, November 7–8, 2003
- Discontinuous Versions of Some Classical Inequalities, Scientific Computing Seminar, University of South Carolina, February 18, 2004
- Multigrid Algorithms for C⁰ Interior Penalty Methods, Finite Element Circus, University of Pittsburgh, April 16–17, 2004
- Multigrid Algorithms for C⁰ Interior Penalty Methods for Fourth Order Problems, Twelfth Copper Mountain Conference on Multigrid Methods, Copper Mountain, Colorado, April 3–8, 2005

Other Conferences and Workshops Attended

- Program on Scientific Computation, Institute for Mathematics and its Applications, August 17–December 15, 1986
- ACM Conference on the History of Scientific and Numeric Computation, Princeton, New Jersey, May 13–15, 1987
- AMS Centennial Conference, Providence, Rhode Island, August 8–12, 1988
- Finite Element Circus, The Pennsylvania State University, October 21–22, 1988
- The Future of Calculus, Ithaca College, April 15, 1989
- Introductory and Advanced Supercomputing Workshops, Cornell National Supercomputer Facility, October 23–27, 1989
- Finite Element Circus, UMBC, November 10–11, 1989
- MODULEF Workshop, The Pennsylvania State University, July 16–20, 1990
- Finite Element Circus, Rutgers University, October 12–13, 1990
- Fifth International Conference on Domain Decomposition Methods for Partial Differential Equations, Norfolk, Virginia, May 6–8, 1991
- Finite Element Circus, The Pennsylvania State University, November 8-9, 1991
- Maple Summer Workshop, University of Waterloo, August 10-14, 1992
- World Congress of Nonlinear Analysts, Tampa, Florida, August 19-26, 1992
- Finite Element Circus, University of Delaware, November 6–7, 1992
- Finite Element Circus, University of Maryland, April 16–17, 1993
- IMA Workshop on Modeling, Mesh Generation and Adaptive Methods for Partial Differential Equations: Error Estimation and Adaptive Strategies, Institute for Mathematics and its Applications, Minneapolis, July 19–23, 1993

- Mathematics of Computation 1943-1993, University of British Columbia, Vancouver, August 8–13, 1993
- Joint Mathematics Meeting, Cincinnati, Ohio, January 10–13, 1994
- Finite Element Circus, Rutgers University, April 29–30, 1994
- Spectral Multi-Domain Methods Workshop, North Carolina State University, Raleigh, North Carolina, May 16–18, 1994
- Southeast Conference of Differential Equations, University of Tennessee at Knoxville, October 21–22, 1994
- Joint Mathematics Meeting, San Francisco, California, January 4–7, 1995
- Finite Element Circus, Brookhaven National Laboratory, March 24–25, 1995
- Summer Research Program: Nonlinear Wave Phenomena, Institute for Advanced Study/ Park City Mathematics Institute (PCMI), Park City, Utah, July 9–29, 1995
- SIAM Annual Meeting, Charlotte, North Carolina, October 23–26, 1995
- Joint Mathematics Meeting, Orlando, Florida, January 10–13, 1996
- Engineering Problems: Mathematical Formulations, Analysis, and Computational Treatment (Conference in honor of the 70th birthday of Ivo Babuška), University of Maryland, March 21–24, 1996
- Finite Element Circus, University of South Carolina, April 19–20, 1996
- The Second World Congress of Nonlinear Analysts, Athens, Greece, July 10-17, 1996
- Molecular Structure: Dynamics, Geometry and Topology, A Workshop, Institute for Mathematics and its Applications, University of Minnesota, January 20-23, 1997
- Basic Mathematics of Medical Imaging, IMA Tutorial, Institute for Mathematics and its Applications, University of Minnesota, March 10-11, 1997
- Eighth SIAM Conference on Parallel Processing for Scientific Computing, Minneapolis, Minnesota, March 14–17, 1997
- Computational Radiology and Imaging, IMA Workshop, Institute for Mathematics and its Applications, University of Minnesota, March 17-21, 1997
- Computational Methods for the Incompressible Navier-Stokes Equations, IMA Short Course, Institute for Mathematics and its Applications, University of Minnesota, April 14-15, May 5-6, 1997
- Finite Element Circus, Courant Institute, New York, New York, April 18-19, 1997
- PDE Software, IMA Tutorial, Institute for Mathematics and its Applications, University of Minnesota, April 21-25, 1997
- Grid Generation and Adaptive Algorithms, IMA Workshop, Institute for Mathematics and its Applications, University of Minnesota, April 28-May 2, 1997
- Finite Element Circus, Cornell University, October 10-11, 1997
- Joint Mathematics Meeting, Baltimore, Maryland, January 7–10, 1998
- Conference on Numerical Analysis and Domain Decomposition in Honor of Olof B. Widlund's 60th Birthday, Courant Institute, January 23–24, 1998

- Finite Element Circus, University of Maryland, College Park, November 6–7, 1998
- Finite Element Circus, Cornell University, October 1–2, 1999
- Homogenization and Effective Media Theories, Mathematical Sciences Research Institute, Berkeley, California, March 6–17, 2000
- A-posteriori Error Estimation and Adaptive Approaches in the Finite Element Method, Mathematical Sciences Research Institute, Berkeley, California, April 3–14, 2000
- Elastic Shells: Modeling, Analysis and Numerics, Mathematical Sciences Research Institute, Berkeley, April 17–28, 2000
- WAVES 2000, Santiago de Compostela, Spain, July 10–14, 2000
- Joint Mathematics Meetings, New Orleans, January 10-13, 2001
- Mixed Finite Element Methods, Oberwolfach, Germany, February 4-8, 2001
- Finite Element Circus, University of Delaware, March 30-31, 2001
- Finite Element Circus, North Carolina State University, November 2–3, 2001
- Joint Mathematics Meetings, San Diego, January 6-9, 2002
- Joint Mathematics Meetings, Baltimore, January 17–19, 2003
- IMA Workshop: Probability and Partial Differential Equations in Modern Applied Mathematics, Minneapolis, July 21–August 1, 2003
- Joint Mathematics Meetings, Phoenix, January 6–10, 2004
- Fourth Singular Days, Pont-à-Mousson, France, June 7-9, 2004
- ECCOMAS 2004, Jyväskylä, Finland, July 24–28, 2004
- Joint Mathematics Meeting, Atlanta, January 5-8, 2005
- Gemischte und nicht-standard Finite-Elemente-Methoden mit Anwendungen, Oberwolfach, Germany, January 30 February 5, 2005
- SIAM-SEAS 2005, Charleston, March 25–26, 2005
- Finite Element Circus, University of Delaware, April 29–30, 2005
- Finite Element Circus, Rutgers University, October 21–22, 2005
- Joint Mathematics Meeting, San Antonio, January 12–15, 2006
- European Finite Element Fair, ETH Zürich, Zürich, Switzerland, June 2–3, 2006
- Festkolloquium zum 75. Geburtstag von Herrn Prof. em. Dr.-Ing. E.h. Dr. h.c. mult. Erwin Stein, Universität Hannover, Hannover, Germany, July 7, 2006
- Joint Mathematics Meeting, New Orleans, January 5-8, 2007