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Education

Candidate of Sciences (CSc., Ph.D. equivalent), Numerical and Approximate Methods, Charles University, Prague, Czechoslovakia, 1983. Advisor B. Sekerka. Thesis title: *On Some Two-Level Iterative Methods*.

Doctor of Natural Sciences (RNDr., M.S. equivalent), Numerical Mathematics, Charles University, Prague, Czechoslovakia, 1978. Thesis title: *Application of Convex Analysis in Timetable Problems*.

Graduated with honors (B.S. equivalent), Faculty of Mathematics and Physics, Charles University, Prague, Czechoslovakia, 1978. Informatics. Specialization: Mathematical methods in economics.

Fields of Interest

Scientific computing: Data assimilation, wildland fire modeling, probability, statistics, numerical solution of partial differential equations, domain decomposition and multigrid methods, level set methods, GPU computing

Professional Experience

Employment History

1986-present University of Colorado Denver, Department of Mathematics. Assistant Professor, Associate Professor (1989), Professor (1992).
1978-1986 Faculty of Mathematics and Physics, Charles University, Prague, Czechoslovakia. Graduate Research Assistant (1978), Research Staff (1982), Scientist (1983), Senior Scientist (1985).

Other Positions

2011 Visiting Faculty, Institute for Computer Science, Czech Academy of Sciences
2006-2009 Visiting Scientist, Mesoscale and Microscale Meteorology Division, National Center for Atmospheric Research, Boulder, CO
1996-2004 Visiting Professor, Department of Aerospace Engineering Science, University of Colorado at Boulder
1995-1999 Director, Graduate Program in Applied Mathematics, University of Colorado at Denver
1993-1994, 2000-present Director, Center for Computational Mathematics, University of Colorado Denver

1993 Visiting Professor, Courant Institute, NY
 1992-present President and founder of Solvers International, Inc., Boulder, CO
 1990, 1989, 1988 IBM T. J. Watson Research Center, N.Y., visiting scientist.
 1987 Visiting Professor, Oxford University Computing Laboratory, Oxford, England.
 1986-1987 Colorado Research Development Corporation, Scientist, part time.
 1985 Visiting Research Associate, University of Colorado at Denver.
 1976-1978 Mototechna Corp., Prague, Software Developer, part-time.

Bibliography

Refereed Journal Publications

1. J. Mandel, B. Sousedík and J. Šístek, Adaptive BDDC in Three Dimensions, *Mathematics and Computers in Simulation*, in print, **2011**
2. J. Mandel, L. Cobb, and J. D. Beezley, On the Convergence of the ensemble Kalman filter, *Applications of Mathematics*, 56, 533-541, **2011**
3. J. Šístek, B. Sousedík, P. Burda, J. Mandel, and J. Novotny, Application of the parallel BDDC preconditioner to the Stokes flow, *Computers and Fluids*, 46, 429-435, **2011**
4. J. Mandel, J. D. Beezley, and Adam K. Kochanski, Coupled atmosphere-wildland fire modeling with WRF 3.3 and SFIRE 2011, *Geoscientific Model Development*, 4, 591-610, **2011**
5. D. H. Glueck, A. Karimpour-Fard, J. Mandel, and K. E. Muller, On probabilities for separating sets of order statistics, *Statistics*, 44, 145-153, **2010**
6. J. Šístek, J. Novotný, J. Mandel, M. Čertíková, and P. Burda, BDDC by a frontal solver and stress computation in a hip joint replacement, *Mathematics and Computers in Simulation*, 80, 1310-1323, **2010**
7. J. Mandel, J. D. Beezley, J. L. Coen, M. Kim, Data assimilation for wildland fires: Ensemble Kalman filters in coupled atmosphere-surface models, *IEEE Control Systems Magazine* 29, Issue 3, 47-65, June **2009**
8. B. Sousedík and J. Mandel, On the equivalence of primal and dual substructuring preconditioners, *Electronic Transactions in Numerical Analysis*, 31, 384-402, **2008**
9. J. Mandel, B. Sousedík, and C. R. Dohrmann, Multispace and multilevel BDDC, *Computing* 83, 55-85, **2008**
10. D. H. Glueck, J. Mandel, A. Karimpour-Fard, L. Hunter, and K. E. Muller, Exact Calculations of Expected Power for the Benjamini-Hochberg Procedure. *The International Journal of Biostatistics*, Vol. 4, Iss. 1, Art. 11, **2008**
11. J. Mandel, L. S. Bennethum, J. D. Beezley, J. L. Coen, C. C. Douglas, M. Kim, and A. Vodacek, A wildland fire model with data assimilation. *Mathematics and Computers in Simulation* 79, 584-606, **2008**
12. D. H. Glueck, A. Karimpour-Fard, J. Mandel, L. Hunter, and K. E. Muller, Fast computation by block permanents of cumulative distribution functions of order statistics from several populations, *Communications in Statistics - Theory and Methods*, 37(18), 2815-2824, **2008**
13. Jonathan D. Beezley and Jan Mandel, Morphing Ensemble Kalman Filters, *Tellus* 60A, 131-140, **2008**
14. C. J. Johns and J. Mandel, A Two-Stage Ensemble Kalman Filter for Smooth Data Assimilation, *Environmental and Ecological Statistics* 15, 101-110, **2008**
15. J. Mandel and B. Sousedík, BDDC and FETI-DP under Minimalist Assumptions, *Computing* 81, 269-280, **2007**
16. J. Mandel and B. Sousedík, Adaptive Selection of Face Coarse Degrees of Freedom in the BDDC and the FETI-DP Iterative Substructuring Methods, *Computer Methods in Applied Mechanics and Engineering* 196, 1389-1399, **2007**

17. J. Mandel, C. R. Dohrmann, and R. Tezaur, An Algebraic Theory for Primal and Dual Substructuring Methods by Constraints, *Applied Numerical Mathematics* 54, 167–193, **2005**
18. J. Mandel and M. Popa, Iterative solvers for coupled fluid-solid scattering, *Applied Numerical Mathematics* 54, 194–207, **2005**
19. J. Mandel and C. R. Dohrmann, Convergence of a Balancing Domain Decomposition by Constraints and Energy Minimization, *Numerical Linear Algebra and Applications* 10, 639–659, **2003**
20. J. Mandel, Local Approximation Estimators for Algebraic Multigrid, *Electronic Transactions on Numerical Analysis* 15, 56–65, **2003**
21. G. Poole, Y-C. Liu, and J. Mandel, Advancing Analysis Capabilities in ANSYS through Solver Technology, *Electronic Transactions on Numerical Analysis* 15, 106–121, **2003**
22. J. Mandel, An Iterative Substructuring Method for Coupled Fluid-Solid Acoustic Problems, *Journal of Computational Physics* 177, 95–116, **2002**
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24. P. Vaněk, M. Brezina, and J. Mandel, Convergence of Algebraic Multigrid Based on Smoothed Aggregation, *Numerische Mathematik* 88, 559–579, **2001**
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77. J. Mandel, The duration of fluid outflow (in Czech), *Rozhledy Matematicko-Fyzikalni* 51, 26-28, **1972-73**

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78. Jonathan D. Beezley, Jan Mandel, and Loren Cobb, Wavelet Ensemble Kalman Filters, *Proceedings of the 6th IEEE International Conference on Intelligent Data Acquisition and Advanced Computing Systems: Technology and Applications (IDAACS'2011), Prague, September 15-17, 2011*, pages 514-518, IEEE, **2011**
79. J. Šístek, P. Burda, J. Mandel, J. Novotný, and B. Sousedík. A parallel implementation of the BDDC for the Stokes flow. In A. Kuzmin, editor, *Computational Fluid Dynamics 2010*, Proceedings of 6th ICCFD Conference, St. Petersburg, Russia, July 12-16, 2010, pages 806-812. Springer, **2011**
80. G. Jordanov, J. D. Beezley, N. Dobrinkova, A. K. Kochanski, J. Mandel, and B. Sousedik, Simulation of the 2009 Harmanli fire (Bulgaria), 8th International Conference on Large-Scale Scientific Computations, June 6-10, 2011, Sozopol, Bulgaria, in print, **2011**
81. N. Dobrinkova, G. Jordanov, and J. Mandel, WRF-Fire Applied in Bulgaria, *Numerical Methods and Applications*, Dimov, I., Dimova, S., and Kolkovska, N., Eds, Lecture Notes in Computer Science 6046, 133-140, Springer, **2011**
82. J. Mandel and B. Sousedík, Coarse spaces over the ages. *Domain Decomposition Methods in Science and Engineering XIX*, Y. Huang, R. Kornhuber, O. Widlund, J. Xu, Eds., Lecture Notes in Computational Science and Engineering 78, Part 2, 213-220, **2011**

83. B. Sousedik and J. Mandel, On Adaptive-Multilevel BDDC, *Domain Decomposition Methods in Science and Engineering XIX*, Y. Huang, R. Kornhuber, O. Widlund, J. Xu, Eds., Lecture Notes in Computational Science and Engineering 78, Part 2, 39-50, **2011**
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86. J. Mandel, J. D. Beezley, and V. Y. Kondratenko, Fast Fourier Transform Ensemble Kalman Filter with Application to a Coupled Atmosphere-Wildland Fire Model, A. M. Gil-Lafuente, J. M. Merigo (Eds.) *Computational Intelligence in Business and Economics*, Proceedings of MS'10, World Scientific, 777-784, **2010**
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91. J. Mandel, J. D. Beezley, L. S. Bennethum, S. Chakraborty, J. L. Coen, C. C. Douglas, J. Hatcher, M. Kim, and A. Vodacek, A Dynamic Data Driven Wildland Fire Model, ICCS 2007, Part I, *Lecture Notes in Computer Science* 4487, 1042-1049, Springer, **2007**
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98. J. Mandel, M. Chen, J.L. Coen, C.C. Douglas, L.P. Franca, C. Johns , R. Kremens, A. Puhalskii, A. Vodacek, W. Zhao, A Note on Dynamic Data driven wildfire modeling, Proceedings ICCS 2004, *Lecture Notes in Computer Science* 3038, 725–731, **2004**
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118. J. Mandel, J. D. Beezley, and A. K. Kochanski, Coupled atmosphere-wildland fire modeling with WRF-Fire 3.3, *Geoscientific Model Development Discussions*, (GMDD) 4, 497-545, **2011**
119. J. Mandel, J. D. Beezley, and A. K. Kochanski, An overview of the coupled atmosphere-wildland fire model WRF-Fire, *AMS 91st Annual Meeting*, Seattle, WA, January **2011**.
120. J. Šístek, P. Burda, J. Mandel, J. Novotný, and B. Sousedík, Application of the BDDC method to the Stokes problem, *Proceedings of 2010 SNA conference*, Institute of Computer Science Institute AS CR, Prague, **2010**, pp. 131-134
121. J. Šístek, P. Burda, A. Damasek, J. Mandel, J. Novotný, B. Sousedík, On a parallel implementation of the BDDC method and its application to the Stokes problem, *2009 Parallel Computational Fluid Dynamics (ParCFD) Conference*, NASA Moffett Field, CA, May **2009**, pp. 183-187
122. J. L. Coen, J. D. Beezley, L. S. Bennethum, C. C. Douglas, M. Kim, R. Kremens, J. Mandel, G. Qin, and A. Vodacek, A Wildland Fire Dynamic Data-driven Application System, *11th Symposium on Integrated Observing and Assimilation Systems for the Atmosphere, Oceans, and Land Surface (IOAS-AOLS)*, CD-ROM, Paper 3.12, 87th American Meteorological Society Annual Meeting, San Antonio, TX, January **2007**
123. J. Mandel and J. D. Beezley, Predictor-Corrector and Morphing Ensemble Filters for the Assimilation of Sparse Data into High-Dimensional Nonlinear Systems, *11th Symposium on Integrated Observing and Assimilation Systems for the Atmosphere, Oceans, and Land Surface (IOAS-AOLS)*, CD-ROM, Paper 4.12, 87th American Meteorological Society Annual Meeting, San Antonio, TX, January **2007**
124. C. Farhat, F. Hemez, and J. Mandel, *Improving the Convergence Rate of a Transient Substructuring Iterative Method Using the Rigid Body Modes of its Static Equivalent*, AIAA

- Paper 95-1271, AIAA 36th Structural Dynamics Meeting, New Orleans, Louisiana April 10-13, **1995**
125. P. Le Tallec, J. Mandel, and M. Vidrascu, Parallel Domain Decomposition Algorithms for Solving Plate and Shell Problems, In: *Advances in Parallel and Vector Processing for Structural Mechanics*, B.H.V. Topping and M. Papadrakakis, editors, (Proceedings, Athens, 1994), pp. 139-145, CIVIL-COMP Ltd, Edinburgh, **1994**
 126. S. Ghosal, J. Mandel, and R. Tezaur, Automatic Substructuring for Domain Decomposition, *Proceedings of IEEE International Conference on Neural Networks*, Orlando, June, 1994, vol. 6, pp. 3816–3821, IEEE, **1994**
 127. J. Mandel, Intelligent Block Iterative Methods, FEM Today and the Future, *Proceedings of the 7th World Congress on Finite Elements*, Monte Carlo, November 1993, J. Robinson, ed., Robinson and Associates, Okehampton, Devon EX20 4NT, England, pp. 471–477, **1993**
 128. J. Mandel, Fast Iterative Solver for Finite Elements Using Incomplete Elimination, *Proceedings of the 1991 MSC World Users' Conference*, Los Angeles, March **1991**, and Preliminary proceedings of the 5th Copper Mountain Conference on Multigrid Methods, April 1991
 129. J. Mandel, On Iterative Methods for Linear Inequalities, In: *Mathematical Programming, Abstracts of the XI. International Symposium on Mathematical Programming*, University of Bonn, Germany, **1981**

Reports and Theses

130. J. Mandel, J. D. Beezley, K. Eben, P. Jurus, V. Y. Kondratenko, and J. Resler, *Data assimilation by morphing fast Fourier transform ensemble Kalman filter for precipitation forecasts using radar images*, UCD CCM Report 289, April **2010**
131. J. Mandel and V. V. Kulkarni, *Constructing a Level Set Function for Fireline Data Assimilation*, CCM Report 234, June **2006**
132. J. Mandel and J. D. Beezley, *Predictor-Corrector Ensemble Filters for the Assimilation of Sparse Data into High Dimensional Nonlinear Systems*, CCM Report 232, June **2006**
133. J. Mandel, *Efficient Implementation of the Ensemble Kalman Filter*, CCM Report 231, May **2006**
134. J. Mandel, M. Chen, J.L. Coen, C.C. Douglas, L.P. Franca, C. Johns, R. Kremens, A. Puhalskii, A. Vodacek, W. Zhao, *Dynamic Data driven wildfire modeling*, CCM Report 208, March **2004**
135. P. Mayer and J. Mandel, *The Finite Ray Element Method for the Helmholtz Equation of Scattering: First Numerical Experiments*, UCD/CCM Report 111, **1997**
136. P. Vaněk, J. Mandel, and M. Brezina, *Solving a two-dimensional Helmholtz problem using algebraic multigrid*, UCD/CCM Report 110, **1997**
137. J. Mandel and M. Popa, *A multigrid method for elastic scattering*, CD/CCM Report 109, **1997**
138. J. Mandel, R. Tezaur, and C. Farhat, *Optimal Lagrange Multiplier Based Domain Decomposition Method for Plate Bending Problems*, UCD/CCM Report 61, **1995**
139. P. Vaněk, J. Mandel, and M. Brezina, *Algebraic Multigrid on Unstructured Meshes*, UCD/CCM Report 34, **1994**
140. S. Ghosal and J. Mandel and R. Tezaur, *Fast Neural Networks for Domain Decomposition in Finite Element Analysis*, UCD/CCM Report 23, **1994**
141. J. Mandel and M. Brezina, *Balancing domain decomposition: Theory and performance in two and three dimensions*, UCD/CCM Report 2, **1993**
142. J. Mandel, An efficient domain decomposition preconditioner for the p-version finite element method in three dimensions, manuscript for *7th International Conference on Finite*

Element Methods in Flow Problems, April 3-7, 1989, The University of Alabama in Huntsville, **1989**

143. J. Mandel, QRINV - *Inversion of Large Matrices by QR Decomposition*, Computing Centre Report, Charles University, Prague, **1986**
144. J. Nečas, J. Hlavaváček, J. Mandel, and J. Roubíček, *Numerical Solution of Thermo-Elasticity Problems*, Annual Report, Charles University, Prague, **1985**
145. J. Mandel, *A Note On the Relational Database Machine Architecture*, Computing Centre Report, Charles University, Prague, **1984**
146. J. Nečas, J. Hlavaváček, J. Mandel, and J. Roubíček, *Numerical Solution of Thermo-Elasticity Problems*, Annual Report, Charles University, Prague, **1984**
147. J. Mandel, *An Extended COBOL Compiler Using Generation of Declarations from PSL/PSA and a Preprocessor of Decision Tables PROTAB-25*, Computing Centre Report, Charles University, Prague, **1984**
148. J. Mandel, *Multilevel Iterative Methods for Some Variational Inequalities and Optimization Problems*, Computing Centre Report, Charles University, Prague, **1983**
149. J. Mandel, *Convergence of Some Two-Level Iterative Methods*, Ph.D. Thesis, Charles University, Prague, **1982**
150. J. Mandel, *Application of Convex Analysis in Timetable Problems*, M.S. Thesis, Charles University, Prague, **1978**

Book Reviews

151. J. Mandel, *Multigrid Methods and Applications by Wolfgang Hackbusch*, SIAM Review 30, 519-520, **1988**

Submitted for Publication

152. J. Sistek, J. Mandel, B. Sousedik and P. Burda, *Parallel implementation of multilevel BDDC*, ENUMATH 2012, submitted, **2012**.
153. J. Mandel, J. D. Beezley, A. K. Kochanski, and V. Y. Kondratenko, *Assimilation of Perimeter Data in a Coupled Wildland Fire – Atmosphere DDDAS*, ICCS 2012, submitted, **2012**.
154. A. K. Kochanski, M. A. Jenkins, S. K. Krueger, J. Mandel, and J. D. Beezley, *Real-time simulation of 2007 Santa Ana fires*, Forest Ecology and Management, submitted, 2012.

Presentations at Conferences and Symposia

(see also **Refereed and Non-refereed Conference Proceedings**)

- | | |
|---------------|--|
| June 2011 | <i>Spectral and morphing ensemble Kalman filters and applications</i> (with J. D. Beezley, L. Cobb, A. Krishnamurthy, A. K. Kochanski, K. Eben, P. Jurus, and J. Resler), 31st Annual International Symposium on Forecasting, Prague, Czech Republic |
| June 2011 | Invited plenary lecture, <i>Wildland fire modeling on computer clusters</i> (with J. D. Beezley, N. Dobrinkova, G. Jordanov, A. K. Kochanski, V. Y. Kondratenko, and B. Sousedik), Monitor II mid-term conference, Bolzano, Italy. |
| January 2011 | Jan Mandel, Jonathan D. Beezley, and Loren Cobb, <i>Spectral and morphing ensemble Kalman filters</i> , AMS 91st Annual Meeting, Seattle, WA, January 2011 |
| December 2010 | A. Kochanski, M. Jenkins, S. K. Krueger, J. Mandel, J. D. Beezley, C. B. Clements, <i>Evaluation of The Fire Plume Dynamics Simulated by WRF-Fire</i> , AGU Fall Meeting, 2010 |

- December 2010 *Wildland fire simulation by WRF-Fire* (poster, with J. D. Beezley, A. K. Kochanski, V. Y. Kondratenko, B. Sousedik, E. Anderson, and J. Daniels), AGU Fall Meeting, San Francisco, CA
- December 2010 Invited plenary lecture, *Coupled atmosphere-wildland fire simulation by WRF-Fire*, IMA Workshop Numerical Solutions of Partial Differential Equations: Fast Solution Techniques
- November 2009 *Morphing ensemble Kalman filter and applications* (with J. Beezley), UCD CCM Colloquium
- October 2009 *Convergence of the Ensemble Kalman Filter* (with L. Cobb and J. Beezley), Department of Statistics, Colorado State University, Fort Collins, CO
- August 2009 Invited plenary speaker, *Adaptive multilevel BDDC*, 19th International Conference on Domain Decomposition, Zhangjiajie, China
- August 2009 Invited lecture, *Coarse space through the ages*, Minisymposium on Coarse Spaces, 19th International Conference on Domain Decomposition, Zhiangjiajie, China
- August 2008 Invited speaker, *Data assimilation by morphing ensemble Kalman filters with application to wildland fires*, Workshop on sensing in environmental systems, LNCC, Petropolis, Brazil
- April 2008 *Towards a Real-Time Data Driven Wildland Fire Model* (with the wildfires team), IPDPS08, Miami
- August 2007 Invited plenary speaker, *Multilevel and multispace BDDC*, with B. Sousedik and C. Dohrmann, Computational Methods with Applications, Computational Linear Algebra and Applications, Harrachov, Czech Republic
- October 2006 Invited speaker, *Ensemble Kalman Filters for Wildfire Simulation* (with the DDDAS wildfires team), Center for Subsurface Modeling Industrial Sponsors meeting, University of Texas at Austin
- April 2006 Invited lecture, *Coupled Weather-Wildfire Modeling Driven by Sensor and Image Data*, (with the DDDAS wildfires team), NSF Workshop on Cyber-Based Combustion Science, NSF, Arlington, VA
- July 2003 Invited plenary speaker, Industrial Mathematics and Mathematical Modelling, Rožnov pod Radhoštěm, Czech Republic, *Tutorial on Mathematical Foundations of Iterative Substructuring Methods*
- June 2003 Fast Solvers for Partial Differential Equations, Oberwolfach (by invitation only), *An Algebraic Convergence Theory for Primal and Dual Substructuring Methods by Constraints*
- March 2003 Sixth IMASC Symposium on Iterative Methods in Linear Algebra, *Algebraic Convergence Theory for Substructuring*
- January 2002 Invited plenary speaker, International Conference on Domain Decomposition 14, Cocoyoc, Mexico, *Iterative substructuring for fluid-solid acoustics*
- June 2001 Invited speaker, Modelling 2001, Plzen, Czech Republic, *Iterative Substructuring for Coupled Fluid-Solid Acoustics*
- May 2001 Fast Solvers for Partial Differential Equations, Oberwolfach (by invitation only), Germany, *Adaptive Aggregation in Algebraic Multigrid*
- April 2001 Copper Mountain Conference on Multigrid Methods, *Approximation and Coupling Estimators for Algebraic Multigrid*
- May 1999 Fast solution of differential equations, Oberwolfach, Germany (by invitation only), *Analysis of FETI substructuring methods*
- August 1999 *Robust balancing domain decomposition* (with P. Krzyzanowski), International Conference on Computational Mechanics, Boulder, CO.
- May 1999 8th Copper Mountain Conference on Multigrid Methods, *Fast Computation of Energy Minimal Coarse Basis Functions by Smoothing and Projection*

- 1994 SIAM Annual Meeting, San Diego, *Iterative Methods for Thin p-Version Finite Elements*
- 1993 Invited speaker, 7th International Symposium on Domain Decomposition Methods, Penn State, *Domain Decomposition for Plates*
- 1993 MAFELAP'93, Brunel University, U.K., *Balancing domain decomposition*
- 1993 MAFELAP'93, Brunel University, U.K., *Iterative methods for high order elements*
- 1992 AMS-SIAM Summer Seminar "Exploiting Symmetry in Applied and Numerical Analysis," Fort Collins, CO, *An abstract theory for the domain reduction methods*
- 1992 Copper Mountain Conference on Iterative Methods, *Adaptive preconditioners*
- 1992 Sixth International Symposium on Domain Decomposition Methods, Como, Italy, *Domain Decomposition on Unstructured Domains*
- 1992 Second International Conference on Spectral and High-Order Methods, Montpellier, France, *An iterative solver for p-version finite elements in three dimensions*
- 1991 Invited Speaker, Miniconference on Domain Decomposition, Lexington, KY, *Balancing domain decomposition preconditioners*
- 1991 Invited Speaker, Summer Conference on Domain Decomposition, Lambrecht, Germany, *Adaptive iterative solvers by incomplete elimination*
- 1991 Fifth Copper Mountain Conference on Multigrid Methods, *Fast iterative solver for finite elements using incomplete elimination*
- 1991 MSC User's Conference, Los Angeles, March, *Fast iterative solver for finite elements using incomplete elimination*
- 1990 Copper Mountain Conference on Iterative Methods, *On Schur complement and block diagonal preconditioning*
- 1989 SIAM Annual Meeting, San Diego, *Iterative methods for the p-version finite element method*
- 1989 Invited Speaker, International Conference on Spectral and High Order Methods for partial Differential Equations, Como, Italy, *Iterative solvers by substructuring for the p-version finite element method*
- 1989 Third International Conference on Domain Decomposition methods, Houston, TX, *Domain decomposition preconditioning for the p-version finite element method*
- 1989 Fourth Copper Mountain Conference on Multigrid Methods, Copper Mountain, CO, *Two-Level domain decomposition preconditioning for the p-version finite element method in three dimensions*
- 1988 Invited speaker, Second International Conference on Domain Decomposition Methods, Los Angeles, *Iterative solution of elliptic equations with refinement: The two-level case*
- 1988 Finite Element Circus, University of Maryland, College Park, MD, *Parallel preconditioning for the p-version finite element method*
- 1987 Third Copper Mountain Conference on Multigrid Methods, *Fourier analysis of a multigrid method for 3D elasticity problems*
- 1987 Second Conference on Multigrid Methods, Oberwolfach, Germany (by invitation only), *A multigrid method for singular and eigenvalue problems*
- 1987 Finite Element Circus, Cornell University, *Multigrid methods for singular and eigenvalue problems*
- 1985 Invited speaker, 2nd Copper Mountain Conference on Multigrid Methods, *Multigrid convergence for nonsymmetric, indefinite variational problems and one smoothing step*

- 1985 Invited speaker, 2nd European Conference on Multigrid Methods, *On multigrid and iterative aggregation methods for nonsymmetric problems*
- 1984 Conference on Multigrid Methods, Oberwolfach, Germany (by invitation only), *Algebraic study of multigrid methods for symmetric, definite problems.*
- 1983 Workshop on Defect Correction Methods, Oberwolfach, Germany (by invitation only), *On some two-level iterative methods*
- 1982 XXI International Symposium on Mathematical Programming, Bonn, Germany, *On iterative methods for linear inequalities*

Colloquium Lectures

- 2011 Department of Applied Mathematics, University of Colorado Boulder; Institute for Mathematics and Scientific Computing, Karl-Franzens University, Graz, Austria
- 2010 Max-Planck Institute, Leipzig, Germany
- 2009 Institute of Informatics of the Czech Academy of Sciences, Prague, Czech Republic, Department of Statistics, State University, Fort Collins, CO
- 2008 Czech Technical University, Czech Academy of Sciences, Prague, Czech Republic
- 2006 National Center for Atmospheric Research, Department of Mathematics, Colorado State University, Fort Collins, CO
- 2004 Technical University Ostrava, Czech Technical University Praha, Czech Republic
- 2003 University of Kentucky, Colorado Linux Users and Enthusiasts, University Colorado at Boulder
- 2002 Sandia National Laboratories, Albuquerque
- 2000 Department of Aerospace Engineering, University of Colorado at Boulder
- 1999 University of Wyoming
- 1996 Colorado School of Mines
- 1995 Colorado State University
- 1994 University of Wyoming
- 1993 Courant Institute, INRIA (Rocquencourt, France), West Bohemian University (Plzen, Czech Republic)
- 1992 Rice University, University of Texas at Austin
- 1990 Pennsylvania State University, Stanford University, IBM T.J. Watson Research Center, Colorado State University, Purdue University
- 1989 Courant Institute, University of Southern California
- 1988 University of Wyoming
- 1987 IBM TJ Watson Research Center, Courant Institute, Stanford University, Yale University, Oxford University
- 1986 University of Wisconsin-Madison

Awards

- 2010 University of Colorado Denver Campus Research Award (the only faculty member so far to win twice)
- 2007 Paper Mandel, Dohrmann, Tezaur, 2005, selected by ISI as the Fast Breaking Highly Cited paper in Mathematics and Statistics for June 2007
- 2002 College of Liberal Arts and Sciences Research Award
- 1992 University of Colorado at Denver Campus Research Award
- 1991 Honorable Mention - Technical paper, 1991 MacNeal-Schwendler Corporation World Users' Conference (paper selected by conference attendees)

Other Professional Activities

Society Membership

Society for Industrial and Applied Mathematics (SIAM)

Professional Service

- 2009 One NSF advisory panel
- 2008 Two NSF advisory panels
- 2007 Two NSF advisory panels
- 2006 One NSF advisory panel
- 2005 One NSF advisory panel, one DOE advisory panel
- 2004 Two NSF advisory panels, one DOE advisory panel
- 2003 Program Chair, Sixth IMACS International Symposium on Iterative Methods in Scientific Computing, Denver
- 2002 One NSF Advisory panel
- 2001 One NSF Advisory panel and one invited workshop
- 2000 Two NSF Advisory panels
- 1999 Two NSF Advisory panels
- 1998-2005 SIAM J. Numerical Analysis, member of editorial board.
- 1998 Co-chair, Tenth International Symposium on Domain Decomposition, Boulder, CO, August, Principal editor of proceedings.
- 1998 NSF advisory panel
- 1997 Three NSF advisory panels
- 1996 Two NSF advisory panels
- 1995 NSF advisory panel
- 1995 NSF advisory panel
- 1994 NSF advisory panel
- 1993 NSF advisory panel
- 1992-present Member of IMACS committee on Numerical Linear Algebra.
- 1991 Program Chair, Fifth Copper Mountain Conference on Multigrid Methods; guest editor of special issue of Communications in Applied Numerical Mathematics.
- 1991 Member of international program committee, IMACS International Symposium on Iterative Methods in Linear Algebra, Brussels, March 1991
- 1989 Co-chair, Fourth Copper Mountain Conference on Multigrid Methods, co-editor of proceedings
- 1987-2002 Program committee member, Copper Mountain Conferences on Multigrid Methods
- 1987 Program Chair, Third Copper Mountain Conference on Multigrid Methods, co-editor of Proceedings.
- 1987-1990 Chair of the Computational Mathematics Group Colloquium Series, University of Colorado at Denver.
- 1984-1986 Program Chair and Co-Organizer (with I. Marek, head of the Numerical Mathematics Department) of a monthly seminar on Multigrid Methods at Charles University, Prague.

Consultantships

- 1993 D. H. Brown Associates, Inc., Port Chester, NY, competitive analysis of parallel computers.
- 1988 Noetic Technologies Corp., St. Louis, MO, finite element methods.
- 1988 IBM Corporation, Research Division, NY, hybrid computing.
- 1984-1985 Project Optimization of Thermoelastic Systems, supported by Skoda Plzen Corp.,

Czechoslovakia (with J. Nečas and T. Roubicek).
1978 Research Institute of Education, Prague, Czechoslovakia, statistics.

Reviewer and Referee Service

Reviewer for U.S. National Science Foundation, U.S. Department of Energy, British Research Council, European Research Council, Czech Grant Agency, Applied Mathematics and Computation, Journal of Optimization Theory and Applications, Aplikace Matematiky, Journal of Computational Physics, Applied Numerical Mathematics, SIAM Journal on Numerical Analysis, Mathematics of Computation, International Journal of Wildland Fire, International Journal for Numerical Methods in Engineering, Computer Methods in Applied Mathematics and Engineering, Numerical Partial Differential Equations, Simulation, Transactions on Modeling and Computer Simulation, Neurocomputing, Journal of Fire Sciences, Mathematical Reviews and Zentralblatt für Mathematik. Member of proposal evaluation panels at the National Science Foundation and the Department of Energy.

Students Graduated

PhD

2009 Jonathan D. Beezley
2008, 2010 Bedrich Sousedik
2002 Mirela Popa
1998 Radek Tezaur
1997 Marian Brezina
1990 G. Scott Lett

MS

2010 Volodymyr Kondratenko
2009 Myung Joo Song
2005 Charles Glaze, Sumbal Jullion
2002 Gantulga Tsendendorj
1997 Abderrahman Seffriouri
1988 Victor Bandy, Joe Ottero

Contracts and Grants

2009-2011 *Improved Tracking for Emerging Diseases from Climate Change*, NIH 1 RC1 LM010641-01, \$613,030, Co-PI (Loren Cobb, PI)
2009 *TESLA S1070 GPU supercomputing server*, NVIDIA, equipment valued \$4,300
2008-2012 *MRI-Consortium: Acquisition of a Supercomputer by the Front Range Computing Consortium*, NSF CNS-0821794, \$2,796,500, Co-PI (with CU-Boulder and NCAR, Henry Tufo, PI)
2008-2012 *Collaborative Research: CDI-Type II-The Open Wildland Fire Modeling E-community: A Virtual Organization Accelerating Research, Education, and Fire Management Technology*, NSF ATM-0835579, \$653,556, PI. Part of \$1.6M group of collaborative grants with NCAR and University of Utah, lead PI.
2008 *Continued Funding for the Wildland Fires Project, UCD CLAS CRISP*, \$13,123
2007-2011 *Adaptive Multilevel Iterative Substructuring Methods*, NSF DMS-0713876, \$209,965

2007-2009 *CSR-CSI: Collaborative Research: Dynamic Sensor/Computation Network for Wildfire Management*, NSF CNS-0719641, \$99,999

2007-2008 *Data Assimilation in Atmospheric Sciences*, PI, NSF DMS-0623983, \$99,965.

2004-2005 *Adaptive Strategies for the Salinas FETI-DP Solver* (renewal), PI, Sandia National Laboratories, \$48,961.

2004-2007 *Acquisition of an IBM BlueGene/L Supercomputer*, CU-Denver PI, NSF, \$119,332. Part of \$1.5M group of collaborative grants with CU-Boulder and NCAR.

2003-2004 *Adaptive Strategies for the Salinas FETI-DP Solver* (renewal), PI, Sandia National Laboratories, \$49,999.

2003-2008 *Data Dynamic Simulation for Disaster Management* (with Leo Franca and Tolya Puhalskii, UCD; Janice Coen, NCAR; Craig Douglas, University of Kentucky; Tony Vodacek and Bob Kremmens, Rochester Institute of Technology; and Wei Zhao, Texas A&M), lead PI, NSF ITR grant, \$2,064,000. UCD part NSF ITR 0325314, \$621,001.

2003 *Adaptive Strategies for the Salinas FETI-DP Solver*, PI, Sandia National Laboratories, \$39,893.

2000-2001 *Acquisition of a High-Performance Parallel Computer for Mathematical Sciences and Applications*, NSF DMS-0079719 Co-PI (Andrew Knyazev, PI), \$100,000.

2000-2004 *Scalable Submesh Computing*, NSF DMS-0074278, PI, \$155,000.

1997-2001 *High Performance simulation of Multiphysics Problems* (CO-PI and subcontract PI; Carlos Felippa, CU-Boulder PI), NSF ECS-9725504, \$312,000.

1998-2001 *Sensitivity Analysis Of Coupled Acoustic Problems to Structural Boundary Conditions and Efficient Numerical Solution Algorithms*, Co-PI (at CU-Boulder, Charbel Farhat, PI), ONR N-00014-95-1-0663, \$320,000.

1995-1998 *Sensitivity Analysis Of Coupled Acoustic Problems to Structural Boundary Conditions and Efficient Numerical Solution Algorithms*, (with Charbel Farhat, CU-Boulder), subcontract PI, 3 years, \$161,000, ONR grant N-00014-95-1-0663

1995-1996 *Mathematical Sciences Computing Research Environments*, NSF DMS-9508328, with T. Russell, L. Franca, A. Knyazev, C. Liu, \$50,000.

1994-1996 *Artificial Intelligence in Numerical Computing – CISE Postdoctoral Research Associateship for S. Ghosal*, Co-PI with Harvey Greenberg, NSF Grant ASC-9404734, \$42,000.

1994 *Advanced Iterative Solvers for High Order Finite Elements*, NSF Grant SBIR DMI-9360015, at Solvers International, Inc., PI, \$64,857.

1993-1996 *Parallel Methods for Large-Scale Computations*, NSF Grant ASC-9121431, PI, \$240,595.

1992-1997 *GAFD Turbulence and Coupled Fields*, NSF grant no. ASC-9217394 (Grand Challenge, through CU Boulder), subcontract PI, \$312,500.

1991 *Fast Iterative Solvers for MSC/EMAS*, MacNeal-Schwendler Corporation, PI, \$50,000

1990-1993 *Multilevel Algorithms for Advanced Computers*, NSF grant no. DMS-9015259, \$240,000 (with S. McCormick, T. Manteuffel, and T. Russell)

1989 *Computational Mathematics Group Local Area Network*, NSF SCREMS, \$42,000 (with S. McCormick and T. Manteuffel).

1989 *Junior Faculty Development Award*, University of Colorado at Denver, \$4,500.

1988 *Fourth Copper Mountain Conference on Multigrid Methods*, US Air Force AFOSR-89-0224, \$26,885 (with S. McCormick).

1987-1990 *Multilevel Algorithms for Advanced Computers*, NSF DMS-8704169, \$560,000 (with S. McCormick and T. Manteuffel)