Wolfgang Bangerth: Curriculum Vitae

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Born	May 14th, 1973, Ostfildern, Germany
Nationality	German, United States permanent resident ("greencard")

Contents

1 Education

1979–1983	Primary School Wolfschlugen
1983–1992	Gymnasium Nürtingen; Abitur with grades "very good"
1992–1993	Military Service in a telecommunications unit

1993–1995	Study of Physics at the University of Stuttgart; Vordiplom (Bachelor) with grades "very good – good"
1995–1999	Study of Physics at the University of Heidelberg; Diploma thesis on adaptive finite element methods for the wave equation; Grades: "very good, with distinction"
1999–2002	Work on a Ph.D. thesis on "Adaptive Finite Element Methods for the Identification of Distributed Parameters in Partial Differential Equations" under the supervision of Prof. R. Rannacher (Heidelberg). Member of the Graduiertenkolleg "Modellierung und Wissenschaftliches Rechnen in Mathematik und Naturwissenschaften"; Grades: "summa cum laude" ("with distinction").

2 Appointments

2001	Exterior Research Fellow with Industrial Research Ltd., Wellington, New Zealand.
2002–2003	Postdoctoral Research Fellow at the Institute for Computational Engineering and Sciences (ICES), University of Texas at Austin.
2003–2005	Postdoctoral Research Fellow with joint position at the Institute for Computational Engineering and Sciences (ICES) and the Institute for Geophysics, University of Texas at Austin.
2005	Consultant (Research Scientist) for the Department of Chemistry, Texas A&M University.
2006–2007	External Research Fellow, Institute for Geophysics, University of Texas at Austin.
2005–2009	Assistant Professor, Department of Mathematics, Texas A&M University.
2009–2012	Associate Professor, Department of Mathematics, Texas A&M University.
2013–2017	Professor, Department of Mathematics, Texas A&M University.
2016–	Professor, Department of Mathematics, Colorado State University.

3 Professional experience

1998–	Principal author and maintainer of the deal.II finite element library (see http://www.dealii.org/).
2005–2015	Elected member of the Science Steering Committee (2005–2008, 2008–2011) and Executive Committee (2011–2015), Computational Infrastructure in Geodynamics, an NSF-funded center devoted to the creation of open source software in geophysics (see http://www.geodynamics.org/).
2009–2011	Member, Executive Committee of the Department of Mathematics, Texas A&M University.
2009–2014	Member, editorial board, SIAM Journal on Scientific Computing (SISC).
2010–2014	Member, Executive Committee of the Institute for Applied Mathematics and Computational Science (IAMCS), Texas A&M University.
2011–	Member, editorial board, ACM Transactions on Mathematical Software (ACM TOMS).
2013–2015	Member, Executive Committee, Council of Principal Investigators, Texas A&M University.
2016–	Member, NSF Advisory Committee on Software Infrastructure for Heterogeneous Computing.

4 Awards

1999–2001	Ph.D. fellowship from Graduiertenkolleg "Modellierung und Wissenschaftliches Rechnen in Mathematik und Naturwissenschaften" (Modeling and scientific computing in mathematics and natural sciences), University of Heidelberg, Germany
2002–2003	Postdoctoral Research Fellowship from the Institute for Computational Engineering and Sciences (ICES), University of Texas at Austin
2003–2005	Palisades Geophysical Institute (PGI) Postdoctoral Fellowship from the Institute for Geophysics, University of Texas at Austin
2006	My deal.II finite element library software is accepted into the computing industry standard SPEC CPU2006 benchmark (see http://www.spec.org/); the award is $5,000
2007	Recipient (with G. Kanschat and R. Hartmann) of the J. H. Wilkinson Prize for Numerical Software for the deal.II software; the award is $3,000
2008	Alfred P. Sloan Research Fellowship; the award consists of unrestricted research funds to the amount of $50,000
2014	Outstanding Teaching Award, Dept. of Mathematics, Texas &M University.

5 Other experience

Computers	Knowledge of the Unix operating system, profound knowledge of and experience in object oriented programming with C++ and knowledge of several other programming languages.
	Maintainer of the deal.II finite element library
Languages	Fluent in English, knowledge of French and remnants of Japanese; native speaker of German.
Memberships	Society for Industrial and Applied Mathematics (SIAM),

American Association for the Advancement of Science (AAAS).

6 Teaching and mentoring

6.1 Regular courses

2002	One semester practical course in Advanced Finite Element Software, ETH Zurich, Switzerland.
2005	MATH 609: Numerical Methods for Engineers.
2006	MATH 664: Computational Software for Large-Scale PDE Solvers.
	MATH 412: Theory of partial differential equations.
	MATH 417: Numerical Analysis.
2007	MATH 417: Numerical Analysis.
	MATH 151: Engineering calculus I.
	MATH 412: Theory of partial differential equations.
	Informal weekly class on Numerical Algorithms for Inverse Problems (spring).
	Working seminar on Inverse Problems (fall).
2008	MATH 676: Finite element methods in scientific computing.
2009	MATH 651: Optimization I.
2010	MATH 652: Optimization II.
	MATH 442: Mathematical modeling.
2011	MATH 676: Finite element methods in scientific computing.
2012	MATH 601: Methods of applied mathematics I.
2013	MATH 676: Finite element methods in scientific computing.
	MATH 437: Principles of numerical analysis.
2014	MATH 689: Numerical optimization.
	MATH 442: Mathematical modeling.
2015	MATH 676: Finite element methods in scientific computing.
	MATH 442: Mathematical modeling.
2016	MATH 442: Mathematical modeling.
2017	MATH 561: Numerical analysis I.

Curriculum development
Developed the new course "MATH 676: Finite element methods in scientific computing" (taught as MATH 664 in the spring of 2006).

6.2 Summer and short courses

2012	2-week course *Finite element methods in scientific computing*, Heidelberg, Germany, March 19–30, 2012
	2-week course *Practical parameter estimation methods*, Heidelberg, Germany, July 9–20, 2012
2013	2-day course *Solving PDEs with finite elements via the deal.II library*, EU regional school 2013, Aachen Institute for Advanced Study in Computational Engineering Science, Aachen, Germany, May 8–10, 2013
	3-day course *Finite element methods in scientific computing*, Center for High Performance Computing, University of Cape Town, Cape Town, South Africa, August 5–7, 2013
2014	5-day course *Finite element methods in scientific computing*, Seoul National University, South Korea, June 16–20, 2014

2-day course *Using and extending the mantle convection code ASPECT*, Earth-Life Institute Summer School, Tokyo, Japan, August 1–3, 2014

6.3   Supervision of students

I served as chair or co-chair for the following graduate students:

Past:

Chih-Che Chueh	Department of Mechanical Engineering, University of Victoria, Canada; co-chair of Ph.D. committee; graduated in 2010 Now a postdoc at Queen's University, Canada.
Nate Fredette	Department of Nuclear Engineering, Texas A&M University; co-chair of M.Sc. committee; graduated in 2011 Now a designer at DoE's Knolls Atomic Power Laboratory.
Moritz Allmaras	Department of Mathematics, Texas A&M University; chair of Ph.D. committee; graduated in 2011 Now a researcher at Siemens, Germany
Jennifer Webster	Department of Mathematics, Texas A&M University; chair of Ph.D. committee; graduated in 2013 Now a researcher at Pacific Northwest National Lab
Kainan Wang	Department of Mathematics, Texas A&M University; chair of Ph.D. committee; graduated in 2014 Now a postdoc at the University of Texas at Austin
Fang Wang	Department of Mathematics, Texas A&M University; chair of Ph.D. committee; graduated in 2014 Now a software developer at Stata

Current:

Hung-Chieh Chu	Department of Mechanical Engineering, Texas A&M University; co-chair of Ph.D. committee
Arezou Ghesmati	Department of Mathematics, Texas A&M University; chair of Ph.D. committee

I have served more often than is worth counting as a member on M.Sc. and Ph.D. committees of at least half a dozen departments on campus.

Mentoring of students:

2006	Gregory Thoreson (Nuclear Engineering, Undergraduate Summer Research Grant in Engineering)
2014-2016	Lei Qiao (Aerospace Department, Northwestern Polytechnical University, China; Lei is a long-term visitor in my group for 18 months)
2015-2016	Juliane Dannberg (Geosciences Research Center – GFZ – Potsdam, Germany; Juliane is a long-term visitor in my group for the last year of her PhD time)

6.4   Mentoring of postdocs

2008–2011	Jean Marie Linhart Now an Assistant Professor, Central Washington University
2011–2013	Timo Heister Now an Assistant Professor, Department of Mathematics, Clemson University
2011, 2013	Jörg Frohne (as long-term visitor for several months)

	Now a postdoctoral researcher, Dortmund University and Siegen University, Germany
2012–2014	Markus Bürg Now at a private company in The Netherlands
2013–2015	Bruno Turcksin
2015–	Rene Gassmöller
2016–	Juliane Dannberg

7 Community involvement

7.1 Editorial boards

Member, editorial board, SIAM Journal on Scientific Computing (SISC), 2009–2014.

Member, editorial board, SIMAI Springer Series (a book series on computational science and applied mathematics; editor-in-chief: Luca Formaggia), 2012-2014.

Member, editorial board, ACM Transactions on Mathematical Software (ACM TOMS), since 2011.

Member, editorial board, Archive of Numerical Software (ANS), since 2011.

7.2 Advisory councils, evaluation panels, reviewing

Member, NSF Advisory Committee on Software Infrastructure for Heterogeneous Computing, 2016–.

Elected member of the Science Steeing Committee and later the Executive Committee, Center for Computational Infrastructure in Geodynamics (CIG), located first at Caltech and later at the University of California, Davis, 2005–2015, re-elected 2008, 2011.

Member, Executive Committee of the Department of Mathematics, Texas A&M University, 2009–2011.

Member, Executive Committee of the Institute for Applied Mathematics and Computational Science (IAMCS), Texas A&M University, 2010–2015.

Member, High Performance Computing Committee, Institute for Applied Mathematics and Computational Science, Texas A&M University; 2008–2015.

Member, Intellectual Property Constituent Committee, Texas A&M University; 2012–2015.

NSF Panelist for Cyberenabled Discovery and Innovation (CDI) Type II proposals, 2008.

NSF Panelist for Inverse Problems proposals, 2009.

Member, evaluation committee for Department of Energy SciDAC Applied Math Mid-Term Reviews, 2009.

Reviewer, Department of Energy Graduate Research Fellowship Program, 2010, 2012.

NSF Panelist for Sustained Innovation through Software Infrastructure (SI2) proposals, 2010, 2013, 2014, 2015.

Reviewer for Advances in Engineering Software, Applied Numerical Mathematics, Computer Methods in Applied Mechanics and Engineering (CMAME), Communications in Numerical Methods in Engineering, Engineering with Computers, International Journal of Numerical Methods in Engineering (IJNME), Inverse Problems, Journal of Computational Physics (JCP), Journal of Mathematical Analysis and Applications, Journal of Numerical Analysis, Journal of Petroleum Sciences and Engineering, Mathematics of Computation, Medical Physics, Numerical Methods in Partial Differential Equations (NMPDE), Numerische Mathematik, Optics Express, SIAM Journal on Optimization (SICON), SIAM Journal on Numerical Analysis (SINUM), SIAM Journal on Scientific Computing (SISC), ACM Transactions on Mathematics Software (ACM TOMS)

Reviewer, complete draft of a book in scientific computing, 2010

7.3 Organization of workshops, minisymposia and conferences

Member of the organizing team of the ENUMATH'97 conference, Heidelberg, Germany, 1997

Co-organizer of a mini-symposium on adaptive methods at the GAMM Jahrestagung (GAMM Annual Conference), Zurich, Switzerland, 2001.

Member of the program committee of a workshop on "Parallel/High-Performance Object-Oriented Scientific Computing (POOSC 05)" at the "European Conference on Object-Oriented Programming (ECOOP 2005)", Glasgow, UK, 2005.

Member of the program committee of a workshop on "Parallel/High-Performance Object-Oriented Scientific Computing (POOSC 06)" at the "European Conference on Object-Oriented Programming (ECOOP 2006)", Tours, France, 2006.

Organizer of a "Workshop on Computational Science Issues in Geodynamics Applications", Austin, TX, October 16-17, 2006.

Organizer of a minisymposium "High-level software for the numerical solution of partial differential equations" at ICIAM 2007, Zurich, Switzerland, July 16-20, 2007.

Organizer and main speaker (19 hours) of a "Workshop on Adaptive Mesh Refinement Techniques in Geodynamics Applications", Boulder, CO, October 24-27, 2007.

Member of the program committee of a workshop on "Parallel/High-Performance Object-Oriented Scientific Computing (POOSC 08)" at the "European Conference on Object-Oriented Programming (ECOOP 2008)", Paphos, Cyprus, 2008.

Organizer of the workshop "Mathematical and Computational Issues in the Solid Earth Geosciences", Santa Fe, NM, September 15–17, 2008.

Organizer of the "CBMS Conference on Adaptive Finite Element Methods for Partial Differential Equations", College Station, TX, May 18–22, 2009.

Member of the program committee of a workshop on "Parallel/High-Performance Object-Oriented Scientific Computing" at "Systems, Programming, Languages and Applications: Software for Humanity (SPLASH),

2010", Reno/Tahoe, NV, 2010.

Co-organizer of the "IAMCS Workshop in Large-Scale Inverse Problems and Uncertainty Quantification", College Station, TX, 2011.

Co-organizer of session "Software in CS&E" and "Information Theory – Inversion Problems, Applications and Algorithms", SIAM Computational Science and Engineering Conference, Boston, February 2013.

Co-organizer of the session "Advances in Computational Methods in Solid Earth Geophysics", American Geophysical Union Fall Conference, San Francisco, December 2013.

Organizer, "Fourth deal.II users and developers workshop", College Station, TX, August 2013.

Organizer, "First ASPECT Users and Developers Hackathon", College Station, TX, May 2014.

Organizer, "Fifth deal.II users and developers workshop", College Station, TX, August 2015.

Organizer, "Second ASPECT Users and Developers Hackathon", Bodega Bay, CA, May 2015.

Member of the program committee of the annual "Supercomputing" conference, 2013, 2015, 2016.

Member of the program committee of the "IEEE Cluster" conference, 2016.

7.4 Other service activities

Elected member of the Texas A&M University Faculty Senate, 2006–2009.

Member of the nominating committee for candidates to the Science Steering Committee and Executive Committee of the Center for Computational Infrastructure in Geodynamics, 2006.

Co-author of the report "The Path to Peta-scale Computing in Geodynamics. A report by the Science Steering Committee, Computational Infrastructure for Geodynamics (CIG)" to the National Science Foundation, November 2006.

Chair of the nominating committee for candidates to the Science Steering Committee and Executive Committee of the Center for Computational Infrastructure in Geodynamics, 2009.

Elected member of the Texas A&M University Council of Principal Investigators, 2009–2015.

Member, Institute for Applied Mathematics and Computational Sciences (IAMCS), Institute for Scientific Computation (ISC), Center for Large Scale Scientific Computing (CLASS), all at Texas A&M University.

8 Presentations at conferences and elsewhere

Invited presentations are marked with an asterisk *. Co-organization of the respective event/mini-symposium is marked by a plus +. Keynote or plenary talks to a greater audience or with a larger time allotment than standard talks are indicated by a dagger †.

1999	*	International Conference on Theoretical and Computational Acoustics, Trieste, Italy
		European Conference on Numerical Mathematics and Applications, Jyvaeskylae, Finland
2000		GAMM Workshop on Numerical Mathematics, Kiel, Germany
		Waves 2000, Santiago de Compostela, Spain
		Numerical Modelling in Continuum Mechanics, Prague, Czech Republic
	*	16th IMACS World Congress, Lausanne, Switzerland
2001	*+	GAMM Jahrestagung (GAMM Annual Conference), Zurich, Switzerland
2002	*	International Conference on Multifield Problems, Stuttgart, Germany
	*	World Congress on Computational Mathematics, Vienna, Austria
2003		Finite Element Rodeo, Houston, TX, USA
		SIAM Conference on Computational Science and Engineering, San Diego, CA, USA
		SIAM Conference on Mathematical and Computational Issues in the Geosciences, Austin, TX, USA
		USNCCM, Albuquerque, NM, USA
2004	*	Computational Infrastructure in Geodynamics (www.geodynamics.org), planning workshop, Los Angeles, CA, USA
		Finite Element Rodeo, Austin, TX, USA
	*	Supercomputing 2004, Pittsburgh, PA, USA
2005	*	Photonics West/Optical Tomography and Spectroscopy of Tissue VII, San Jose, CA, USA
		SIAM Conference on Computational Science and Engineering, Orlando, FL, USA
2006	*+	deal.II User Workshop, Heidelberg, Germany
		IEEE International Symposium on Biomedical Imaging (ISBI), Arlington, VA, USA, 2006
		SIAM Conference on Imaging, Minneapolis, MN, USA, 2006
	*+	European Conference on Object Oriented Programming (ECOOP), Nantes, France, 2006
	*+	Workshop on Computational Science Issues in Geodynamics Applications, Austin, TX, 2006
2007	*	SIAM Conference on Computational Science and Engineering, Costa Mesa, CA, 2007
	*	IEEE International Symposium on Biomedical Imaging (ISBI), Arlington, VA, USA, 2007
	*	Oberwolfach seminar on adaptivity and error estimation Oberwolfach, Germany, 2007
	*	Applied Inverse Problems conference, Vancouver, Canada, 2007
	*	ICCOPT-MOPTA 2007 conference, Hamilton, Canada, 2007
	*	MAMOS workshop, Austin, TX, October, 2007
	*+	Main speaker (19 hours) of a "Workshop on Adaptive Mesh Refinement Techniques in Geodynamics Applications", Boulder, CO, October 24-27, 2007
2008	*	CT 2008 – Tomography Confluence, An International Conference on the Applications of Computerized Tomography; Indian Institute of Technology Kanpur, India, February 15–17, 2008

	*	SIAM Conference on Parallel Processing for Scientific Computing; Atlanta, GA, March 12–14, 2008
	*+	Mathematical and Computational Issues in the Solid Earth Geosciences; Santa Fe, NM, September 15–17, 2008
2009	*	SIAM Conference on Computational Science and Engineering; Miami, FL, March 2–6, 2009
		ACM Symposium on Applied Computing; Honolulu, HI, March 9–12, 2009
	*	Finite Elements in Fluids 2009; Tokyo, Japan, April 1–3, 2009
	*	Compatible and Innovative Discretizations for Partial Differential Equations; Oslo, Norway, June 17–19, 2009
	*	Numerical Modeling of Crustal Deformation and Earthquake Faulting; Golden, CO, June 22–26, 2009
	*	Banff workshop on Mathematical Methods in Emerging Modalities of Medical Imaging; Banff, Canada, October 25–30, 2009
2010	*	SIAM Conference on Parallel Processing; Seattle, WA, February 24–26, 2010
	*	IAMCS Workshop on Computational and Mathematical Challenges in Material Science and Engineering: Complex Fluid Dynamics; Thuwal, Saudi Arabia, March 22–25, 2010
	*	Second deal.II Users Meeting; Heidelberg, Germany, August 23–25, 2010
2011	*	SIAM Conference on Computational Science and Engineering; Reno, NV, February 28–March 4, 2011
	*	Phys-Math-Viz workshop, Cook's Branch, TX, March 12, 2011
	+	American Geophysical Union Fall Meeting, San Francisco, CA, December 6-10, 2011
2012	*	International Conference on Applied Mathematics; Shanghai, China, April 16–20, 2012
	*	CIG mantle convection workshop, Davis, CA, July 29 – August 2, 2012
	*	3rd deal.II user workshop, Heidelberg, Germany, August 6 – 10, 2012
2013	*+	SIAM CS&E conference, Boston, MA, February February 25 – March 1, 2013
	*	Large-Scale Inverse Problems and Quantification of Uncertainty: Big Data Meets Big Models, Santa Fe, NM, May 22–24, 2013
	*	SIAM Geosciences conference, Padova, Italy, June 17–20, 2013
	*†	Africomp conference, Livingstone, Zambia, July 30 – August 2, 2013
	*†	Fourth deal.II Users and Developers Workshop, College Station, TX, August 19–22, 2013
2014	+	First ASPECT Users and Developers Hackathon, College Station, TX, May 14–23, 2014
	*†	Parallel Matrix Algorithms and Applications 2014, Lugano, Switzerland, July 2–4, 2014
		Supercomputing 2014, New Orleans, LA, November 16–21, 2014
2015	*†	Finite Elements in Fluids, Taipeh, Taiwan, March 16-18, 2015
	*	Pan-American Congress on Computational Mechanics, Buenos Aires, Argentina, April 27-29, 2015
	+	Second ASPECT Users and Developers Hackathon, Bodega Bay, CA, May 19-30, 2015
	*†	Fifth deal.II Users and Developers Workshop, College Station, TX, August 3-7, 2015

	∗†	Fifth deal.II Users and Developers Workshop, College Station, TX, August 3-7, 2015
	∗	American Geophysical Union Fall Meeting, San Francisco, CA, December 14-18, 2015
2016	∗	Computational Infrastructure in Geodynamics Annual Meeting, Davis, CA, June 20-22, 2016
	+	Third ASPECT Users and Developers Hackathon, Lake Tahoe, CA, June 24-July 2, 2016
	∗	Oberwolfach seminar on "Self-Adaptive Numerical Methods for Computationally Challenging Problems", Oberwolfach, Germany, September 4-10, 2016
	∗	4th Workshop on Sustainable Software for Science: Practice and Experiences (WSSSPE4), Manchester, UK, September 12-14, 2016
	∗†	Symposium on Finite Element Software, Johannesburg, South Africa, October 11-14, 2016
		American Geophysical Union Fall Meeting, San Francisco, CA, December 12-16, 2016

Other presentations:

Colloquium, Institute for Geophysics, Technical University of Munich (1999)

Colloquium, Institute for Geophysics, Technical University of Munich (2001)

Presentation, Industrial Research Ltd., Wellington, New Zealand (2001)

Colloquium, Seminar for Applied Mathematics, ETH Zürich (2002)

Colloquium, Photon Migration Laboratories, Texas A&M University (2003)

Colloquium, Applied Mathematics, University of Heidelberg (2003)

Colloquium, Computational and Applied Mathematics, Rice University (2004)

Colloquium, Department of Mathematics, University of Pittsburgh (2004)

Colloquium, Department of Mathematics, University of Pittsburgh (2005)

Colloquium, Department of Mathematics, University of Colorado/Denver (2005)

Colloquium, Department of Mathematics, Colorado State University (2005)

Colloquium, Department of Mathematics, Texas A&M University (2005)

Colloquium, Division of Mathematics, Sandia National Laboratories (2005)

Colloquium, Department of Mathematics, Colorado State University (2005)

Colloquium, Applied Mathematics, University of Heidelberg (2006)

Colloquium, Institute for Computational and Applied Mathematics (ICES), University of Texas at Austin (2007)

Colloquium, Electrical Engineering Department, Katholieke Universiteit Leuven, Belgium (2007)

Colloquium, Department of Mathematics, University of Houston (2007)

Colloquium, Department of Mathematics, Indian Institute of Technology Kanpur, India (2008)

Colloquium, Department of Mathematics and Statistics, McGill University, Montreal, Canada (2008)

Colloquium, Department of Mathematics, Southern Methodist University (2009)

Colloquium, Institute for Computational Engineering and Sciences, University of Texas at Austin, Austin, TX (2009)

Colloquium, Applied Mathematics, University of Heidelberg, Germany (2010)

Seminar, Mathematical and Computer Sciences and Engineering Division, King Abdullah University of Science and Technology (KAUST), Saudi Arabia (2011)

Colloquium, Mathematics, University of Stuttgart, Germany (2012)

Colloquium, Applied Mathematics, University of Heidelberg, Germany (2012)

Colloquium, RIKEN Advanced Institute of Computational Sciences, Kobe, Japan (2012)

Colloquium, Mathematics, University of Berne, Switzerland (2012)

Seminar, Applied Mathematics, University of Basel, Switzerland (2012)

Colloquium, Zentralinstitut für Scientific Computing (ZISC), University of Erlangen-Nuremberg, Germany (2012)

Seminar, Applied Mathematics, University of Aachen, Germany (2012)

Lothar-Collatz-Kolloquium für Angewandte Mathematik, University of Hamburg, Germany (2012)

Colloquium, Konrad-Zuse-Institute for Information Technology, Berlin, Germany(2012)

Colloquium, Geoforschungszentrum, Potsdam, Germany (2012)

Applied Mathematics Seminar, University of Texas at Arlington, Arlington, TX (2012)

Seminar in Computational Science & Engineering, Massachusetts Institute of Technology (MIT), Boston, MA (2013)

Colloquium, Saudi Aramco, Dharan, Saudi Arabia (2013)

Earth and Planetary Sciences Seminar, Harvard University, Boston, MA (2014)

Colloquium, Institute for Computational Engineering and Sciences, University of Texas at Austin, Austin, TX (2014)

Colloquium, Department of Geology and Geophysics, Texas A&M University, College Station, TX (2014)

Michigan Institute for Computational Discovery and Engineering (MICDE) Seminar Series, University of Michigan, Ann Arbor, MI (2014)

Colloquium, Department of Mathematics, Virginia Tech, Blacksburg, VA (2015)

Colloquium, Department of Mathematics, University of Bonn, Germany (2015)

Colloquium, Computational and Applied Mathematics Department, Rice University, Houston, TX (2015)

Colloquium, Department of Mathematical Sciences, Clemson University, Clemson, SC (2015)

Seminar, Department of Mathematics, University of Houston, Houston, TX (2016)

Colloquium, Department of Mechanical Engineering, University of Glasgow, UK (2016)

Colloquium, Department of Mathematics, Colorado State University, Fort Collins, CO (2016)

Colloquium, Virginia Tech, Blacksburg, VA (2016)

Computational Modeling and Data Sciences seminar/Colloquium of the Department of Mathematics, Virginia Tech, Blacksburg, VA (2016)

Geology Distinguished Lecture Series, Utah State University, Logan, UT (2016)

Numerical Analysis Seminar, Department of Mathematics, University of Leicester, Leicester, UK (2016)

Seminar, Department of Geology, University of Leicester, Leicester, UK (2016)

9 Support

Currently funded support:

- NSF award EAR-1550901: "Computational Infrastructure for Geodynamics" (8/15/2016–7/31/2021): Member of proposal writing committee; PI is Louise Kellogg, University of California, Davis; $8,500,000.

- Subcontract from Computational Infrastructure for Geodynamics (an NSF-funded research center): "Geoinformatics: Facility Support: Computational Infrastructure for Geodynamics" (8/15/2016–7/31/2021): PI; $595,051.

- NSF award OCI-1148116: "Collaborative Research: SI2-SSI: Open source support for massively parallel, generic finite element methods" (7/1/2012–6/30/2017): PI; $1,493,420 (of this, $1,311,834 go to Texas A&M).

Past support:

- Deutsche Forschungsgemeinschaft (DFG, German Science Foundation) postdoctoral stipend for research at the University of Texas at Austin (9/2002–8/2003); declined in favor of a stipend from the Institute for Computational Engineering and Sciences, The University of Texas at Austin.

- NIH: "Diagnostic cancer imaging with NIR fluorescence" (7/1/2005–6/30/2008): PI; subaward over $173,124 to a grant of $3M.

- NSF award DGE-0549487: "IGERT: New materials and mathematical modeling" (6/1/2006–5/31/2011): Research advisor; PI: Joe Ross, Texas A&M; $2,817,300.

- DoE: "3-D deep penetration neutron imaging of thick absorbing and diffusive objects using transport theory" (5/1/2007–4/30/2011): co-PI; PI: Jean Ragusa, Texas A&M; $283,093.

- NSF award DMS-0604778: "Mathematical Methods for Novel Modalities of Medical Imaging" (9/1/2006-8/31/2009), co-PI; PI: Peter Kuchment, Texas A&M; $330,276 + a supplement of $55,905.

- NSF award CBET-0736202 (transferred to the Department of Homeland Security, grant 2008-DN-077-ARI018-02): "A framework for developing novel detection systems focused on interdicting shielded HEU" (9/1/2007–8/31/2012): co-PI; PI: Warren Miller, Texas A&M; $7,496,076.

- Computational Infrastructure in Geodynamics (an NSF-funded research center): "A suite of simple geodynamics applications using adaptive finite element methods" (4/1/2008–10/31/2009): PI; $100,458.

- King Abdullah University of Science and Technology: "Institute for Applied Mathematics and Computational Science (IAMCS) at Texas A&M University" (6/1/2008–5/31/2014): collaborator; $24,720,657.

- Sloan Foundation Research Fellowship: "Inverse Problems and Computational Science" (9/1/2008–8/31/2010): PI; $50,000.

- NSF award DMS-0834176: "NSF/CBMS Regional Conference in the Mathematical Sciences - Adaptive Finite Element Methods for Partial Differential Equations" (5/18/09–5/22/09): co-PI; PI: Guido Kanschat, Texas A&M; $33,731.

- NSF award DMS-0922866: "Cluster Computing for Mathematical Sciences at Texas A&M University" (6/1/2009-5/31/2010): co-PI; PI: Frank Sottile, Texas A&M; $59,480.

- Institute for Applied Mathematics and Computational Science (Texas A&M University) Innovation Award: "Exploiting sparsity in solving geoscience inverse problems" (1/1/2010–8/31/2010): PI; $20,000.

- Institute for Applied Mathematics and Computational Science (Texas A&M University) Innovation Award: "Simulating chemically reactive, laminar flow" (6/1/2012–5/31/2013): PI; $25,000 + $15,000 for travel.

- Computational Infrastructure for Geodynamics: Workshop support for "Developer meeting for the ASPECT code" (5/14–23/2014): PI; $20,000.

- NSF award EAR-0949446: "Geoinformatics: Facility Support: Computational Infrastructure for Geodynamics" (7/1/2010–6/30/2016): Member of proposal writing committee; PI is Louise Kellogg, University of California, Davis; $8,175,001.

- Subcontract from Computational Infrastructure for Geodynamics (an NSF-funded research center): "Geoinformatics: Facility Support: Computational Infrastructure for Geodynamics" (7/1/2010–6/30/2016): PI; $814,221.

- Korean National Science Foundation: "Implementation of nonconforming finite elements in the adaptive finite element package deal.II and development of nonconforming finite element library for the simulation of semiconductor" (11/2014-10/2016): Investigator; PI is Dongwoo Sheen; 200,000,000 Won (approximately $180,000).

10   Publications

The following is a list of all my publications and what others have written about my work. Metrics and citation counts can be found on my Google Scholar page.

Articles written about my work

[1] W. Bell. Good prospects. *Access, the quarterly journal of NCSA*, 18(1):1–4, 2005.
This article also appeared in the *GRIDSTART Business Newsletter*, March 2005, pp. 6-8, as well as *GRID today*, edition of March 28, 2005.

[2] Developers of finite element library receive Wilkinson prize for numerical software. *SIAM News*, 40(9):7–8, November 2007.

[3] M. Downey. Bombs away. *Advance: Research, Scholarship and Creative Achievement at Texas A&M University*, pages 16–18, 2009.

[4] V. Patel. Texas A&M researcher receives $1.3 million to make supercomputing easier. College of Science, Texas A&M University: News & Events March 2013, see http://www.science.tamu.edu/articles/1001; this article was re-published in many other venues, including HPCwire, FreshNews, and the Dallas Business Journal.

[5] E. Mulvaney. Texas a&m researcher receives grant 'supercomputing' work. Houston Chronicle, March 28, 2013, see http://www.chron.com/news/houston-texas/houston/article/Texas-A-M-researcher-receives-grant-for-4391680.php.

[6] V. Patel. Researchers turn to Texas A&M software to visualize Earth's interior. College of Science, Texas A&M University: News & Events May 2013, see http://www.science.tamu.edu/articles/1066.

[7] S. Hutchins. Mathematics couple co-authors paper on supercomputing. College of Science, Texas A&M University: News & Events October 2014, see http://www.science.tamu.edu/news/story.php?story_ID=1290.

Books

[1] W. Bangerth and R. Rannacher. *Adaptive Finite Element Methods for Differential Equations*. Birkhäuser Verlag, 2003.

Editorials

[1] W. Bangerth and T. Heister. Quo vadis, scientific software? Editorial, SIAM News, January 2014.

[2] W. Bangerth, J. Dannberg, R. Gassmöller, and T. Heister. Computational modeling of convection in the earths mantle. Editorial, SIAM News, March 2016.

Peer reviewed articles

[1] W. Bangerth and R. Rannacher. Finite element approximation of the acoustic wave equation: Error control and mesh adaptation. *East–West J. Numer. Math.*, 7(4):263–282, 1999.

[2] W. Bangerth and R. Rannacher. Adaptive finite element techniques for the acoustic wave equation. *J. Comput. Acoustics*, 9(2):575–591, 2001.

[3] W. Bangerth. Starting threads in a C++ compatible fashion. *C/C++ Users Journal*, pages 21–24, October 2003.

[4] W. Bangerth, M. Grote, and C. Hohenegger. Finite element method for time dependent scattering: Nonreflecting boundary condition, adaptivity, and energy decay. *Comp. Meth. Appl. Mech. Engrg.*, 193:2453–2482, 2004.

[5] G. F. Carey, W. Barth, J. A. Woods, B. Kirk, M. L. Anderson, S. Chow, and W. Bangerth. Modeling error and constitutive relations in simulation of flow and transport. *International Journal for Numerical Methods in Fluids*, 46:1211–1236, 2004.

[6] H. Klie, W. Bangerth, M. Wheeler, M. Parashar, and V. Matossian. Parallel well location optimization using stochastic algorithms on the grid computational framework. In *Proceedings of the 9th European Conference on the Mathematics of Oil Recovery (ECMOR IX), Cannes, France*, 2004.

[7] A. Joshi, W. Bangerth, and E. M. Sevick-Muraca. Adaptive finite element modeling of optical fluorescence-enhanced tomography. *Optics Express*, 12(22):5402–5417, November 2004.

[8] A. Joshi, W. Bangerth, A. B. Thompson, and E. M. Sevick-Muraca. Experimental fluorescence optical tomography using adaptive finite elements and planar illumination with modulated excitation light. *Progr. Biomed. Optics Imag.*, 6:351–358, 2005.

[9] W. Bangerth, A. Joshi, and E. M. Sevick-Muraca. Adaptive finite element methods for increased resolution in fluorescence optical tomography. *Progr. Biomed. Optics Imag.*, 6:318–329, 2005.

[10] W. Bangerth, H. Klie, V. Matossian, M. Parashar, and M. Wheeler. An autonomic reservoir framework for the stochastic optimization of well placement. *Cluster Computing*, 8:255–269, 2005.

[11] M. Anderson, W. Bangerth, and G. F. Carey. Analysis of parameter sensitivity and experimental design for a class of nonlinear partial differential equations. *Int. J. Numer. Meth. Fluids*, 48:583–605, 2005.

[12] M. Parashar, H. Klie, U. Catalyurek, T. Kurc, W. Bangerth, V. Matossian, J. Saltz, and M. F. Wheeler. Application of grid-enabled technologies for solving optimization problems in data-driven reservoir studies. *Future Generation Computer Systems*, 21:19–26, 2005.

[13] A. Joshi, W. Bangerth, K. Hwang, J. C. Rasmussen, and E. M. Sevick-Muraca. Plane wave fluorescence tomography with adaptive finite elements. *Optics Letters*, 31:193–195, 2006.

[14] A. Joshi, W. Bangerth, and E. M. Sevick-Muraca. Non-contact fluorescence optical tomography with scanning area illumination. In *Proceedings of the IEEE International Symposium on Biomedical Imaging, Arlington, VA, 2006*, pages 582–585. IEEE, 2006.

[15] A. Joshi, W. Bangerth, K. Hwang, J. C. Rasmussen, and E. M. Sevick-Muraca. Fully adaptive FEM based fluorescence optical tomography from time-dependent measurements with area illumination and detection. *Med. Phys.*, 33(5):1299–1310, 2006.

[16] A. Joshi, W. Bangerth, and E. M. Sevick-Muraca. Non-contact fluorescence optical tomography with scanning patterned illumination. *Optics Express*, 14(14):6516–6534, 2006.

[17] W. Bangerth, H. Klie, M. F. Wheeler, P. Stoffa, and M. Sen. On optimization algorithms for the reservoir oil well placement problem. *Comp. Geosciences*, 10:303–319, 2006.

[18] H. Klie, W. Bangerth, X. Gai, M. F. Wheeler, P. L. Stoffa, M. Sen, M. Parashar, U. Catalyurek, J. Saltz, and T. Kurc. Models, methods and middleware for Grid-enabled multiphysics oil reservoir management. *Engineering with Computers*, 22:349–370, 2006.

[19] K. Hwang, T. Pan, A. Joshi, J. C. Rasmussen, W. Bangerth, and E. M. Sevick-Muraca. Influence of excitation light rejection on forward model mismatch in optical tomography. *Phys. Med. Biol.*, 51(22):5889–5902, 2006.

[20] W. Bangerth, R. Hartmann, and G. Kanschat. deal.II – a general purpose object oriented finite element library. *ACM Trans. Math. Softw.*, 33(4):24/1–24/27, 2007.

[21] A. Joshi, W. Bangerth, R. Sharma, W. Wang, and E. M. Sevick-Muraca. Molecular tomographic imaging of lymph nodes with NIR fluorescence. In *Proceedings of the IEEE International Symposium on Biomedical Imaging, Arlington, VA, 2007*, pages 564–567. IEEE, 2007.

[22] W. Bangerth, A. Joshi, and E. M. Sevick-Muraca. Inverse biomedical imaging using separately adapted meshes for parameters and forward model variables. In *Proceedings of the IEEE International Symposium on Biomedical Imaging, Arlington, VA, 2007*, pages 1368–1371. IEEE, 2007.

[23] W. Bangerth. A framework for the adaptive finite element solution of large inverse problems. *SIAM J. Sc. Comput.*, 30:2965–2989, 2008.

[24] W. Bangerth and A. Joshi. Adaptive finite element methods for the solution of inverse problems in optical tomography. *Inverse Problems*, 24:034011/1–22, 2008[1]

[25] M. Bartels, A. Joshi, J. C. Rasmussen, E. M. Sevick-Muraca, and W. Bangerth. Post-image acquisition excitation light mitigation in NIR fluorescent tomography. In *Proceedings of the IEEE International Symposium on Biomedical Imaging, Arlington, VA, 2008*. IEEE, 2008.

[26] A. Joshi, W. Bangerth, and E. Sevick. Non-contact fluorescence optical tomography with adaptive finite element methods. In Y. Censor, M. Jiang, and A. K. Louis, editors, *Mathematical Methods in Biomedical Imaging and Intensity-Modulated Radiation Therapy (IMRT)*, pages 185–200. Birkhäuser, 2008.

[27] W. Bangerth and O. Kayser-Herold. Data structures and requirements for *hp* finite element software. *ACM Trans. Math. Softw.*, 36(1):4/1–4/31, 2009.

[28] Y. Wang, W. Bangerth, and J. Ragusa. Three-dimensional *h*-adaptivity for the multigroup neutron diffusion equations. *Progr. Nucl. Energy*, 51:543–555, 2009.

[29] B. Turcksin, J. C. Ragusa, and W. Bangerth. Goal-oriented *h*-adaptivity for the multigroup SP_N equations. *Nuclear Science and Engineering*, 165:305–319, 2010.

[30] W. Bangerth, M. Geiger, and R. Rannacher. Adaptive Galerkin finite element methods for the wave equation. *Computational Methods in Applied Mathematics*, 10:3–48, 2010.

[31] C.-C. Chueh, M. Secanell, W. Bangerth, and N. Djilali. Multi-level adaptive simulation of transient two-phase flow in heterogeneous porous media. *Comp. Fluids*, 39:1585–1596, 2010.

[32] W. Bangerth, C. Burstedde, T. Heister, and M. Kronbichler. Algorithms and data structures for massively parallel generic adaptive finite element codes. *ACM Trans. Math. Softw.*, 38:14/1–28, 2011.

[33] M. Allmaras and W. Bangerth. Reconstructions in ultrasound modulated optical tomography. *J. Inv. Ill-posed problems*, 19:801–823, 2011.

[34] M. Kronbichler, T. Heister, and W. Bangerth. High accuracy mantle convection simulation through modern numerical methods. *Geophysics Journal International*, 191:12–29, 2012.

[35] M. Allmaras, W. Bangerth, J. M. Linhart, J. Polanco, F. Wang, K. Wang, J. Webster, and S. Zedler. Estimating parameters in physical models through Bayesian inversion: A complete example. *SIAM Review*, 55:149–167, 2013.

[36] C.-C. Chueh, N. Djilali, and W. Bangerth. An h-adaptive operator splitting method for two-phase flow in 3d heterogeneous porous media. *SIAM J. Sci. Comput.*, 35:B149–B175, 2013.

[37] W. Bangerth and T. Heister. What makes computational open source software libraries successful? *Computational Science & Discovery*, 6:015010/1–18, 2013.

---

[1]This article was selected for the Editorial Board Highlights 2008 of the Journal "Inverse Problems".

[38] J. Zarestky and W. Bangerth. Teaching high performance computing: Lessons from a flipped classroom, project-based course on finite element methods. In *EduHPC '14: Proceedings of the Workshop on Education for High-Performance Computing*, pages 34–41, Piscataway, NJ, USA, 2014. IEEE Press.

[39] O. Aguilar, M. Allmaras, W. Bangerth, and L. Tenorio. Statistics of parameter estimates: A concrete example. *SIAM Review*, 57:131–149, 2015.

[40] J. Frohne, T. Heister, and W. Bangerth. Efficient numerical methods for the large-scale, parallel solution of elastoplastic contact problems. *International Journal for Numerical Methods in Engineering*, 105:416–439, 2016.

[41] B. Turcksin, M. Kronbichler, and W. Bangerth. *WorkStream* – a design pattern for multicore-enabled finite element computations. *ACM Transactions on Mathematical Software*, 43(1):2/1–2/29, 2016.

[42] J. Bartlett, J. DeVinney, E. Pudlowski, and W. Bangerth. Mathematical modeling of the 2014/2015 Ebola epidemic in West Africa. *SIAM Journal of Undergraduate Research Online*, 9:87–102, 2016.

[43] W. Bangerth, D. Davydov, T. Heister, L. Heltai, G. Kanschat, M. Kronbichler, M. Maier, B. Turcksin, and D. Wells. The `deal.II` library, version 8.4. *Journal of Numerical Mathematics*, 24:135–141, 2016.

[44] W. Bangerth, I. Kim, D. Sheen, and J. Yim. On hanging node constraints for nonconforming finite elements using the douglas-santos-sheen-ye element as an example. *SIAM J. Numer. Analysis, accepted*, 2017.

[45] R. Agelek, M. Anderson, W. Bangerth, and W. L. Barth. On orienting edges of unstructured two- and three-dimensional meshes. *ACM Transactions on Mathematical Software*, 44:5/1–22, 2017.

[46] D. Arndt, W. Bangerth, D. Davydov, T. Heister, L. Heltai, M. Kronbichler, M. Maier, J.-P. Pelteret, B. Turcksin, and D. Wells. The `deal.II` library, version 8.5. *Journal of Numerical Mathematics, accepted for publication*, 2017.

[47] T. Heister, J. Dannberg, R. Gassmöller, and W. Bangerth. High accuracy mantle convection simulation through modern numerical methods. ii: Realistic models and problems. 2017.

Software

[1] Wolfgang Bangerth, Timo Heister, and Guido Kanschat. `deal.II` *Differential Equations Analysis Library.* http://www.dealii.org/.

[2] Wolfgang Bangerth, Timo Heister, and others. ASPECT*: Advanced Solver for Problems in Earth's ConvecTion.* Manual. http://aspect.dealii.org/.

Freely available versions of the Open Source deal.II software are periodically released. The latest release 8.4 was made available in March 2016, see

http://www.dealii.org/news.html

deal.II is widely used around the world in research and teaching. An attempt at listing all publications prepared using the library can be found at

http://www.dealii.org/publications.html

I am also the author of the ASPECT code to simulate convection in the earth mantle and that is used in the geosciences, see http://aspect.dealii.org. ASPECT is a new code and consequently is still building a community of users. It is accompanied by a 400-page manual.

Video lectures

Starting in the spring 2013 semester, I have recorded a sequence of 67 lectures on computational science that are available on YouTube. The YouTube channel for these lectures can be found here. The primary site for these videos, providing a description of every lecture and other material is at `http://www.math.colostate.edu/~bangerth/videos.html`.

The videos are used in teaching at a number of universities around the world, as well as by users of the deal.II library referenced in the previous section. Collectively, they are viewed approximately 1,800 times per month.

Proceedings articles (not peer reviewed)

[1] W. Bangerth. Mesh adaptivity and error control for a finite element approximation of the elastic wave equation. In Alfredo Bermúdez, Dolores Gómez, Christophe Hazard, Patrick Joly, and Jean E. Roberts, editors, *Proceedings of the Fifth International Conference on Mathematical and Numerical Aspects of Wave Propagation (Waves2000), Santiago de Compostela, Spain, 2000*, pages 725–729. SIAM, 2000.

[2] W. Bangerth. Using modern features of C++ for adaptive finite element methods: Dimension-independent programming in deal.II. In Michel Deville and Robert Owens, editors, *Proceedings of the 16th IMACS World Congress 2000, Lausanne, Switzerland, 2000*, 2000. Document Sessions/118-1.

[3] A. Joshi, W. Bangerth, A. B. Thompson, and E. M. Sevick-Muraca. Adaptive finite element methods for fluorescence enhanced frequency domain optical tomography: Forward imaging problem. In *Proceedings of the 2004 IEEE International Symposium on Biomedical imaging*, pages 1103–1106, 2004.

[4] R. B. Schulz, J. Peter, W. Semmler, and W. Bangerth. Independent modeling of fluorescence excitation and emission. In *Proceedings of the 2004 OSA Biomedical Topical Meetings*, 2004.

[5] A. Joshi, A. B. Thompson, E. M. Sevick-Muraca, and W. Bangerth. Adaptive finite element methods for forward modeling in fluorescence enhanced frequency domain optical tomography. In *Proceedings of the 2004 OSA Biomedical Topical Meetings*, 2004.

[6] M. Parashar, V. Matossian, W. Bangerth, H. Klie, B. Rutt, T. Kurc, U. Catalyurek, J. Saltz, and M. F. Wheeler. Towards dynamic data-driven optimization of oil well placement. In Vaidy S. Sunderam, Geert Dick van Albada, Peter M. A. Sloot, and et al., editors, *Computational Science – ICCS 2005: 5th International Conference, Atlanta, GA, USA, May 22-25, 2005. Part II*, pages 656–663, 2005.

[7] P. L. Stoffa, M. K. Sen, R. Seifoullaev, H. Klie, X. Gai, W. Bangerth, J. Rungamornrat, and M. F. Wheeler. An analysis of flow-simulation scales and seismic response. In *Proceedings of the SEG*, 2005.

[8] G. Thoreson, J. C. Ragusa, and W. Bangerth. Some advances on inverse particle transport problems with applications to homeland security. *Trans. Am. Nucl. Soc.*, 95:534–537, 2006.

[9] W. Bangerth and A. Joshi. Adaptive finite element methods for nonlinear inverse problems. In D. Shin, editor, *Proceedings of the 24rd ACM Symposium on Applied Computing, March 8–12, 2009, Honolulu, Hawaii*, volume 2, pages 1002–1006. ACM, 2009.

[10] T. Heister, M. Kronbichler, and W. Bangerth. Generic finite element programming for massively parallel flow simulations. In *Proceedings of the ECCOMAS CFD 2010: Fifth European Conference on Computational Fluid Dynamics conference, Lisbon, Portugal, June 14–17, 2010*, 2010.

[11] T. Heister, M. Kronbichler, and W. Bangerth. Massively parallel finite element programming. In R. Keller, E. Gabriel, M. Resch, and J. Dongarra, editors, *Recent Advances in the Message Passing Interface*, volume 6305/2010 of *Lecture Notes in Computer Science*, pages 122–131, 2010.

[12] C. C. Chueh, W. Bangerth, and N. Djilali. Integrated adaptive numerical method for transient two-phase flow in heterogeneous porous media. In *Proceedings of the Seventh International Conference on Computational Fluid Dynamics (ICCFD7), Big Island, Hawaii, July 9–13, 2012*, pages ICCFD7–2904 (9 pages), 2012.

[13] L. Hwang, W. Bangerth, T. Heister, and L. Kellogg. ASPECT: Hackathons as an example of sustaining an open source community. In G. Allen, J. Carver, S.-C. T. Choi, T. Crick, M. R. Crusoe, S. Gesing, R. Haines, M. Heroux, L. J. Hwang, D. S. Katz, K. E. Niemeyer, M. Parashar, and C. C. Venters, editors, *Proceedings of the Fourth Workshop on Sustainable Software for Science: Practice and Experiences (WSSSPE4)*, pages 7/1–3, 2016.

Theses

[1] W. Bangerth. Adaptive Finite-Elemente-Methoden zur Lösung der Wellengleichung mit Anwendung in der Physik der Sonne. Diplomarbeit, Institut für Angewandte Mathematik, Universität Heidelberg, 1998.

[2] W. Bangerth. *Adaptive Finite Element Methods for the Identification of Distributed Parameters in Partial Differential Equations.* PhD thesis, University of Heidelberg, 2002.

Reports and preprints that have not since been published elsewhere

[1] W. Bangerth and G. Kanschat. Concepts for object-oriented finite element software – the `deal.II` library. Preprint 99-43 (SFB 359), IWR Heidelberg, October 1999.

[2] W. Bangerth. Multi-threading support in `deal.II`. Preprint 2000-11, April 2000.

[3] W. Bangerth, T. Heister, L. Heltai, G. Kanschat, M. Kronbichler, M. Maier, B. Turcksin, and T. D. Young. The deal.II Library, Version 8.0. *ArXiv e-prints*, 2013.

[4] W. Bangerth, T. Heister, L. Heltai, G. Kanschat, M. Kronbichler, M. Maier, B. Turcksin, and T. D. Young. The deal.II Library, Version 8.1. *ArXiv e-prints*, 2013.

[5] W. Bangerth, T. Heister, L. Heltai, G. Kanschat, M. Kronbichler, M. Maier, B. Turcksin, and T. D. Young. The `deal.II` library, version 8.2. *Archive of Numerical Software*, 3, 2015.

[6] B. Turcksin, T. Heister, and W. Bangerth. Clone and graft: Testing scientific applications as they are built. *arXiv e-prints, 1508.07231*, August 2015.

[7] W. Bangerth, T. Heister, L. Heltai, G. Kanschat, M. Kronbichler, M. Maier, and B. Turcksin. The `deal.II` library, version 8.3. *Archive of Numerical Software*, 4:1–11, 2016.

Submitted articles

[1] R. Gassmöller, E. Heien, E. G. Puckett, and W. Bangerth. Flexible and scalable particle-in-cell methods for massively parallel computations. 2016, submitted.

Reviews of *Adaptive finite element methods for differential equations*, by Wolfgang Bangerth and Rolf Rannacher

[1] Mark Ainsworth. SIAM Review 46 (2004), pp. 354–356.

[2] Endre Süli. Math. Comp. 74 (2005), pp. 1033–1039.

[3] Volker H. Schulz. MathSciNet, available online under reference MR1960405 (2004b:65002).

[4] Markus Melenk. DMV Jahresbericht 107 , 2005, pp. 31-32 (in German).