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Curriculum Vitae

Carsten Carstensen

Business Address

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Citizenship	Germany

Degrees

05/1988	Diploma in Mathematics (Dipl.-Math.; summa cum laude)
11/1989	Ph.D. in Mathematics (Dr. rer. nat.; summa cum laude)
05/1992	Diploma in Civil Engineering (Dipl.-Ing.; magna cum laude)
02/1993	Habilitation in Mathematics (Dr. rer. nat. habil.)

Positions

01/2010–10/2014	Director of Center Computational Sciences in Adlershof, Interdisciplinary Center of Humboldt Universität
09/2009–08/2014	Distinguished Professor, Department Computational Sciences Engineering, Yonsei University, Seoul, South Korea
Since 12/2003	Full Professor (C4) Humboldt-Universität zu Berlin, Germany
06/2001–12/2003	Full Professor of Numerical Analysis, Vienna UT, Austria
03/1996–05/2001	Full Professor (C4) of Applied Mathematics, Chair of Scientific Computing, Christian-Albrechts-Universität zu Kiel, Germany
04/1995–03/1996	Associate Professor (C3) of Mathematics, TH Darmstadt, Germany
10/1993–03/1995	Research Fellow, Heriot-Watt University, Edinburgh, UK
01/1990–09/1993	Scientific Assistant (C1) University of Hanover, Germany

Education

03/1989–12/1989	Ph.D. Student and Assistant at Department of Applied Mathematics, University of Hanover
10/1983–02/1989	Undergraduate Student in Mathematics and Civil Engineering, University of Hanover
1981–1983	National Service with West German Armed Forces (Reserve Officer)
1972–1981	Secondary School (Gymnasium Winsen (Luhe))

Honours and Awards

1986–1989	Scholarship Studienstiftung des Deutschen Volkes
04/1995	Richard-von-Mises Price 1995 awarded by GAMM
02/2004	Correspondent Member of *Akademie der Wissenschaften und der Literatur Mainz*

Editorial Positions

1993–2008	Reviewer Mathematical Reviews
1998–2007	Editorial Board *Mathematics of Computation*
2001–2013	Editorial Board *SIAM Journal Numerical Analysis*
2006–2017	Editorial Board *Journal of Computational Mathematics*
2006–2019	Editorial Board *Journal of Integral Equations and Applications*
2007–2009	Co-Editor-in-Chief *Rundbrief of GAMM*
Since 2002	Editorial Board *Journal of Numerical Mathematics* (formerly *East-West Journal of Numerical Mathematics*)
Since 2005	Editorial Board *Computational Methods in Applied Mathematics*, Co-Editor since 2010, Editor-in-Chief since 2011
Since 2008	Editorial Board Book-Series *de Gruyter Studies in Mathematics*
Since 2014	Editorial Board *Advanced Modeling and Simulation in Engineering Sciences*
Since 2015	Editorial Board *Computational Mechanics*

Visiting Positions

03/2023–04/2023	JTO Faculty Fellowship, ICES, UT Austin, Texas, USA
09/2018	Professeur invités par Université Paris-Est, France
08/2017	Invited Professorship by Labex Bezout at CERMICS, University Paris-Est, France
01/2017–04/2017	Hausdorff Research Institute for Mathematics, Bonn, Germany
11/2016	Institute Henry Poincare, invited for Numerical methods for PDEs
10/2016	Invited Professorship by Labex Bezout at CERMICS, University Paris-Est, France
2015–2023	Distinguished Visiting Professor at the IIT Bombay, Mumbai, India
08/2014–09/2014	JTO Faculty Fellowship, ICES, UT Austin, Texas, USA

10/2012–11/2012	Oxford Centre for Nonlinear PDE, England, UK
08/2012–09/2012	JTO Faculty Fellowship, ICES, UT Austin, Texas, USA
2011–2012	Distinguished Visiting Professor at IIT Bombay, Mumbai, India
01/2008–04/2008	Hausdorff Research Institute for Mathematics, Bonn, Germany
2007–2010	Distinguished Visiting Professor at the Central European University, Budapest, Hungary
10/2007–12/2007	Von-Neumann-Guest-Professorship, Technische Universität München, Germany
12/2005–01/2006	Department of Mathematics, Hong Kong Baptist University, China
02/2003–06/2003	Isaac Newton Institute for Mathematical Sciences, Cambridge, UK
10/2000–02/2001	Max Planck Institute for Mathematics in the Sciences, Leipzig, FRG
03/2000–05/2000	MSRI, Berkeley, USA
09/1999	University of New South Wales, Sydney, Australia
07/1999	Heriot-Watt University, Edinburgh, UK
03/1998–04/1998	Heriot-Watt University, Edinburgh, UK
03/1996–05/1996	FIM at ETH Zurich, Switzerland

Scientific Societies

GAMM, DMV, Akademie der Wissenschaften und der Literatur Mainz

Other Activities

since 04/1998	GAMM Committee *Analysis of Microstructures* (Founding Chair from 04/1998 till 10/2003; Chair from 2017 until present).
2004–2008	Executive Board of GAMM, International Association of Applied Mathematics and Mechanics
2004–2010	Personal Tutor in the German National Academic Foundation (Vertrauensdozent der Studienstiftung des Deutschen Volkes)
2009–2010	Spokesman of Research Training Group Analysis, Numerics, and Optimization of Multiphase Problems, DFG Graduiertenkolleg 1128

Workshops and Summer Schools

06/1998	GAMM Workshop *Iterative Processes*, University Kiel
08/1998	Summer School *Computational Fluid Dynamic*, Föhr
04/1999	*Numerics of Microstructures*, MFO, Oberwolfach
08/1999	GAMM Workshop *Computational Plasticity*, University Kiel
08/1999	Summer School *Computational Plasticity*, Föhr
01/2000	GAMM Workshop *Adaptive Methods - Error Estimators*, Kiel
07/2000	EPSRC Summer School *Numerical Analysis*, University of Durham
09/2000	Summer School *Microstructures*, Vienna University of Technology
09/2000	Summer School *Microstructures*, Vienna
12/2000	GAMM Workshop *Boundary Element Methods*, Kiel

01/2001 GAMM Workshop *Computational Electromagnetics*, Kiel

02/2001 *Mixed FEM*, MFO, Oberwolfach

06/2001 *Numerics of Microstructures*, MFO, Oberwolfach

09/2001 Summer School *Efficient Algorithms* , University of Munich

01/2002 Vienna GAMM Seminar on *Microstructures*

05/2002 Vienna GAMM Seminar on *Multilevel Methods*

09/2002 Lecturer CISM *Computational Micromechanics of Material Science*, Udine, Italy

10/2002 Vienna GAMM Seminar on *Multilevel Methods*

11/2002 Workshop on Numerical Methods for Multiscale Problems, MPI Leipzig, cf. http://www.mis.mpg.de/scicomp/multiscale2002/

01/2003 Vienna Winter School *Mathematical Foundations of Computational Sciences 2003*

05/2003 First *European Finite Element Fair*, Cambridge, UK

09/2003 International Summer School *Computational Challenges in Partial Differential Equations* at Nis

01/2004 International Summer School at Cape Town, South Africa, *Computational Mechanics: Modelling, Mathematical Analysis, Algorithms*

03/2004 GAMM Minisymposium on *Adaptive FEM*, TU Dresden

06/2004 Second *European Finite Element Fair*

09/2004 Johann-von-Neumann Lectures *On Computational Stochastics*, Humboldt-Universität zu Berlin

10/2004 *Variational Inequalities - Analysis, Simulation and Application*, MFO, Oberwolfach Seminar

11/2004 Johann-von-Neumann Lectures *On Modern Computational PDEs*, Humboldt-Universität zu Berlin

01/2005 Lecture Series *An Introduction to Adaptive Methods*, Special Year on Computational Partial Differential Equations, Indian Institute of Technology Bombay

02/2005 *Gemischte und nicht-standard Finite-Elemente -Methoden, Methoden mit Anwendungen*, MFO, Oberwolfach

04/2005 Workshop *Micromagnetics: Analysis and Computation* Humboldt-Universität zu Berlin

07/2005 International Workshop on *Reliable Methods of Mathematical Modelling* (RMMM 2005), University of Zurich, Switzerland, Co-Organiser

07/2005 Johann-von-Neumann Lectures *On Modelling and Simulation of Microstructure Evolution*, Humboldt-Universität zu Berlin

07/2005 Lecture Series *An introduction to adaptive finite element methods and their a-posteriori error control*, University of South Carolina, USA

07/2005 Minisymposium *A Survey on Error Reduction of Adaptive Finite Element Methods*, Co-Organiser, 8th US National Congress on Computational Mechanics, Austin, 24–28 August 2005

08/2005 Mini-Workshop *Convergence of Adaptive Algorithms*, MFO, Oberwolfach, 14–20 August 2005

09/2005 Advanced School on *Mixed Finite Element Technologies*, CISM, Udine, Italy
09/2005 1. German-Chinese Workshop on Computational and Applied Mathematics, Humboldt-Universität zu Berlin
02/2006 MATHEON Workshop on Computational Partial Differential Equations, Humboldt-Universität zu Berlin
06/2006 Minisymposium *Reliability and Convergence of FEM*, MAFELAP 2006.
07/2006 Minisymposium *Recent advances in adaptive finite element methods*, 7th World Congress on Computational Mechanics, Los Angeles, USA.
08/2006 Lecture series *Relaxierte Finite Elemente Methoden*, Sommerschule Föhr "Simulation und Anwendungen von Mikrostrukturen".
06/2007 MATHEON Workshop on Computational Partial Differential Equations, Humboldt-Universität zu Berlin.
10/2007 Summer School on Adaptive Algorithm Institute of Computational Mathematics, CAS, Beijing, China
10/2007 2. German-Chinese Workshop on Computational and Applied Mathematics, Hangzhou, China
12/2007 African Institute for Mathematical Sciences, South Africa
05/2008 Distinguished Lecture Series *Finite Element Methods* CEU, Budapest, Hungary
06/2008 Minisymposium *Mathematical Foundations of Computational Mechanics*, IACM-ECCOMAS 2008, Venice, Italy
08/2008 *Nonstandard Finite Element Methods*, MFO, Oberwolfach
12/2008 MATHEON Workshop Efficiency and Modelling with Computational Stochastic Partial Differential Equations, Humboldt-Universität zu Berlin
01/2009 Workshop on Numerical Mathematics, Charles University, Prague, Czech Republic
04/2009 Distinguished Lecture Series *Introduction to Modern Calculus of Variations*, CEU, Budapest, Hungary
04/2009 Workshop *Adaptive Finite Element Methods in MATLAB*, CEU, Budapest, Hungary
06/2009 *Computational Multiscale Methods*, MFO, Oberwolfach
06/2009 International Workshop *Reliable Methods of Mathematical Modeling*, Berlin
07/2009 HP-Workshop *Implementation Aspects, Berlin*
10/2009 International Workshop CSE, Yonsei University, Seoul, Korea
02/2011 Advanced CPDE, One Month Summer School, BITS, Goa, India
09/2011 Lecture Series Adaptive FEM, University Zürich, Switzerland
10/2011 Session PDEs, SC2011 Conference, S. Margarita di Pula, Cagliari, Italy
02/2012 *Advanced Computational Engineering*, MFO, Oberwolfach
02/2012 *Adaptive FEM*, Two Weeks Summer School, IISST, Kerala, India
07/2012 *International Workshop CSE*, Yonsei University, Seoul, Korea
07/2012 *International Conference Computational Methods in Applied Mathematics* (CMAM-5), Berlin, Germany
01/2013 *Summer School on Advances in Finite Element Methods*, University of Cape Town, South Africa

02/2013	*Advanced Workshop in Non-Standard Finite Element Methods 2013* at IIT Bombay, Mumbai, India
02/2013	*3rd Indo-German Workshop on Adaptive Finite Element Methods*, Bhubaneswar, India
10/2013	*Hong Kong - Berlin Half-Day Numerical Analysis* at ICTS, Hong Kong Baptist University
04/2014	*Adaptive Finite Element Methods*, Vietnamese German University, Ho Chi Minh City, Vietnam
06/2014	*Computational Multiscale Methods*, MFO, Oberwolfach
07/2014	Minisymposium *World Congress on Computational Mechanics*, Barcelona, Spain
07/2015	*Summer School on Current Research in Finite Element Methods*, Institute of Technology Bombay, Mumbai, India
09/2015	*Computational Engineering*, MFO, Oberwolfach
11/2015	*1st CENTRAL School on Analysis and Numerics for Partial Differential Equations*, Vienna, Austria
11/2015	Workshop *CENTRAL Trends in PDEs*, Vienna, Austria
09/2016	*Adaptive Algorithms*, MFO, Oberwolfach
05/2017	*Frontiers in Partial Differential Equations Analysis and Solvers*, International School Pavia, Italy
06/2017	*Discontinuous Petrov-Galerkin Methods*, MFO, Oberwolfach
07/2018	International Graduate Summer School on *Frontiers of Applied and Computational Mathematics*, Shanghai Jiao Tong University, China
10/2018	*Computational Engineering*, MFO, Oberwolfach
11/2018	International Workshop on *Micromagnetics: Analysis, Numerics, Applications* (MANA 2018), TU Vienna, Austria
04/2019	*Eigenvalue Day 2019*, Humboldt-Universität zu Berlin
09/2019	International Workshop on *Reliable Methods of Mathematical Modeling* (RMMM 2019), TU Vienna, Austria
09/2019	*Minimum Residual & Least-Squares Finite Element Methods*, Humboldt-Universität zu Berlin
07/2021	Indo-Geman SPARC workshop *Adaptive Finite Element Methods*, Zoom platform
11/2022	*Berlin Workshop on Numerical Analysis 2022*, Humboldt-Universität zu Berlin
03/2024	*Advanced Finite Element Methods for Nonlinear PDEs*, TSIMF, Sanya

Teaching Experience

Subjects and Courses Taught

10/1990–02/1991	Functional Analytical Foundations of Computational Mechanics (University of Hanover)
04/1992–07/1992	Special Topics in Partial Differential Equations (University of Hanover)
04/1993–07/1993	Numerical Linear Algebra (University of Hanover)

03/1993	Fast Solvers (Summer School, University of Weimar)
01/1994–04/1994	Calculus of Variations and Partial Differential Equations (Heriot-Watt University, Edinburgh)
01/1995–04/1995	Numerical Treatment of Partial Differential Equations (Heriot-Watt University, Edinburgh)
04/1995–07/1995	Introduction to Numerical Treatment of Partial Differential Equations (TH-Darmstadt)
10/1995–02/1996	Finite Element Methods (TH-Darmstadt)
10/1996–02/1997	Introduction to Scientific Computing I (University of Kiel)
04/1997–07/1997	Introduction to Scientific Computing II (University of Kiel)
04/1997–07/1997	Calculus of Variations and Partial Differential Equations (University of Kiel)
10/1997–02/1998	Introduction to Mathematical Modelling and Scientific Computing I (University of Kiel)
04/1998–07/1998	Introduction to Mathematical Modelling and Scientific Computing II (University of Kiel)
04/1998–07/1998	Applied Functional Analysis (University of Kiel)
08/1998	Computational Fluid Dynamics (Summer School, University of Kiel)
10/1998–02/1999	Geomathematics and Computational Methods (University of Kiel)
08/1999	Computational Plasticity (Summer School, University of Kiel)
10/1999–02/2000	Differential Equations (University of Kiel)
10/1999–02/2000	Applied Mathematics (University of Kiel)
04/2000–07/2000	Numerical Analysis (University of Kiel)
04/2001–06/2001	Adaptive Finite Element Methods (University of Kiel)
10/2001–02/2002	Adaptive Finite Element Methods (Vienna University of Technology)
03/2002–06/2002	Numerical Analysis II (Vienna University of Technology)
10/2002–02/2003	Numerical Analysis I (Vienna University of Technology)
10/2002–02/2003	Adaptive Finite Element Methods (Vienna University of Technology)
04/2004–07/2004	Introducing Chapters of the Numerics of Partial Differential Equations and Variational Inequalities (HU Berlin)
10/2004–02/2005	Numerical Analysis of Partial Differential Equations I (HU Berlin)
04/2005–07/2005	Numerical Analysis of Partial Differential Equations II (HU Berlin)
04/2005–07/2005	Iterative Lösung grosser Gleichungssysteme (HU Berlin)
10/2005–02/2006	Computational Partial Differential Equations I (HU Berlin, with S. Bartels)
04/2006–07/2006	Numerical Analysis (HU Berlin)
04/2006–07/2006	Computational Partial Differential Equations II (HU Berlin, with S. Bartels, J. Geiser)
10/2006–02/2007	Computational Partial Differential Equations II (HU Berlin, with J. Geiser)
04/2007–07/2007	Numerical Analysis (HU Berlin)
04/2007–07/2007	Computational Partial Differential Equations II (HU Berlin)
10/2007–02/2008	Von Neumann Lecture Course: Advances in Computational PDE (Technische Universität München, Germany)
04/2008–07/2008	Numerical Analysis (HU Berlin)
04/2008–07/2008	Computational Partial Differential Equations II (HU Berlin)
10/2008–02/2009	Computational Partial Differential Equations I (HU Berlin)

04/2009–07/2009	Numerical Analysis (HU Berlin)
04/2009–07/2009	Computational Partial Differential Equations II (HU Berlin)
Fall 2009	Finite Element Methods (Yonsei University, Seoul)
01/2010–02/2010	Computational Partial Differential Equations I (HU Berlin)
Fall 2010	Advanced Finite Element Methods (Yonsei University, Seoul)
01/2011–02/2011	Computational Partial Differential Equations I (HU Berlin)
04/2011–07/2011	Adaptive Algorithms (HU Berlin)
04/2011–07/2011	Iterative Solvers (HU Berlin)
Fall 2011	Lecture Series on Finite Element Practice (Yonsei University, Seoul)
01/2012–02/2012	Computational Partial Differential Equations I (HU Berlin)
04/2012–07/2012	Computational Nonlinear Partial Differential Equations II (HU Berlin)
04/2012–07/2012	Numerical Analysis and Optimization (HU Berlin)
04/2013–07/2013	Computational Partial Differential Equations II (HU Berlin)
04/2013–07/2013	Numerical Analysis and Optimization (HU Berlin)
04/2014–07/2014	Computational Partial Differential Equations II (HU Berlin)
04/2014–07/2014	Numerical Analysis and Optimization (HU Berlin)
10/2014–02/2015	Computational Partial Differential Equations I (HU Berlin)
04/2014–07/2015	Special Topics in Numerical Analysis: Computational Nonlinear Partial Differential Equations (HU Berlin)
10/2015–02/2016	Computational Partial Differential Equations I (HU Berlin)
04/2016–07/2016	Numerical Analysis and Optimization (HU Berlin)
04/2016–07/2016	Computational Partial Differential Equations II (HU Berlin)
04/2017–07/2017	Numerical Analysis and Optimization (HU Berlin)
04/2017–07/2017	Special Topics in Numerical Analysis: Adaptive FEM (HU Berlin)
10/2017–02/2018	Numerical Linear Algebra (HU Berlin)
10/2017–02/2018	Functional Analysis (HU Berlin)
04/2018–07/2018	Computational Partial Differential Equations II (HU Berlin)
04/2018–07/2018	Special Topics in Numerical Analysis (HU Berlin)
10/2018–02/2019	Functional Analysis (HU Berlin)
10/2018–02/2019	Seminar Mathematical analysis and numerical treatment of PDE eigenvalues (HU Berlin)
04/2019–07/2019	Numerical Analysis and Optimization (HU Berlin)
04/2019–07/2019	Seminar Inequalities (HU Berlin)
10/2019–02/2020	Computational Partial Differential Equations I (HU Berlin)
04/2020–07/2020	Partial Differential Equations (HU Berlin)
04/2021–07/2021	Numerical Analysis and Optimization (HU Berlin)
04/2021–07/2021	Analysis and Numerical Treatment of Eigenvalue Problems with Elliptic Partial Differential Equations (HU Berlin)
10/2021–02/2022	Computational Partial Differential Equations I (HU Berlin)
10/2021–02/2022	Functional Analysis (HU Berlin)
04/2021–07/2021	Partial Differential Equations (HU Berlin)
04/2021–07/2021	Special Topics in Numerical Analysis: Computational Nonlinear Partial Differential Equations (HU Berlin)

10/2022–02/2023	Special Topics in Numerical Analysis: Theory and Numerical Analysis of Time Evolution Problems (HU Berlin)
04/2023–07/2023	Numerical Analysis and Optimization (HU Berlin)
10/2023–02/2024	Computational Partial Differential Equations I (HU Berlin)

Supervised Students

1. Dörte Helm: Adaptive Gemischte Finite Elemente in der Elastizität. [Adaptive mixed finite element methods in elasticity] (Diploma Thesis April 1998 in Kiel)

2. Sören Bartels: Theorie und Numerik retardierter Integralgleichungen elektromagnetischer Streufelder. [Theory and numerics of retarded integral equations of electromagnetic scattering] (Diploma Thesis March 1999 in Kiel)

3. Carsten Boecker: Zur hp-Version der Finite-Element-Methode: Effiziente Implementation. [On the hp version of the finite element method: efficient implementation] (Diploma Thesis March 1999 in Kiel)

4. Matthias Baumann: Anwendungen nichtkonvexer Minimierungsaufgaben. [Applications of nonconvex minimisation problems] (Thesis for "1. Staatsexamen" June 1999 in Kiel)

5. Katrin Jochimsen: Beiträge zur Numerik von Variationsproblemen zu Mikrostrukturen. [Contributions to numerics of variational problems for microstructures] (Diploma Thesis July 2000 in Kiel)

6. Uta Krebs: Ein zweidimensionales Finite-Elemente-Modell der thermohalinen Zirkulation. [Two-Dimensional Finite Element Model for theormohalin Circulation] (Co-Supervision for Diploma Thesis in August 2001 at Institute for Marine Research in Kiel)

7. Jan Thiele: A Posteriori Finite-Element-Analysis für die lineare Elastizitästheorie. [A Posteriori Finite Element Analysis for Linear Elasticity] (Diploma Thesis July 2003 for TU Munich)

8. Jan Bolte: Adaptive Finite-Elemente-Methoden in 3D für Matlab. [Adaptive Finite Element Methods in 3D for Matlab] (Diploma Thesis August 2003 in Kiel)

9. James Hoffmann: Beiträge zur Theorie der Glättungsoperatoren der a posteriori Fehlerschätzer zur adaptiven Finite-Elemente-Methode. [Contributions to the theory of averaging operators for a posteriori error control in adaptive finite element methods] (Diploma Thesis October 2004 in Kiel)

10. Jan Reininghaus: Adaptivity for a nonconforming finite element method for Maxwell's equations. (Diploma Thesis 2007 in Berlin)

11. David Günther: Ein gemischter Finite Elemente Ansatz für ein nichtlineares Optimal-Design-Problem. (Diploma Thesis December 2007 in Berlin)

12. Joscha Gedicke: A posteriori Fehlerschätzer und adaptives Netzdesign für elliptische Eigenwertprobleme (Diploma Thesis May 2008 in Berlin)

13. Lena Noack: A Posteriori Fehleranalysis für Variationsprobleme. [A posteriori error analysis in the calculus of variations] (Diploma Thesis October 2008 in Berlin)

14. Christian Merdon: A posteriori Fehlerschätzer für elliptische partielle Differentialgleichungen [A posteriori error estimators for elliptic PDEs] (Diploma Thesis June 2009 in Berlin)

15. Andreas Byfut: Higher-order extended FEMs and adaptivity with application in fracture mechanics (Diploma Thesis September 2009 in Berlin)

16. Maria Rozova: A posteriori error analysis for asymmetric mixed FEMs in elasticity (Diploma Thesis November 2010 in Berlin)

17. Robert Altmann: Theoretische und numerische Betrachtung partieller Diffenerentialgleichungen mithilfe des nichtkonformen Park-Sheen Element [Theory and numerical treatment of PDEs via the nonconfroming Park-Sheen finite element] (Diploma Thesis December 2010 in Berlin)

18. Mira Schedensack: Vergleichbarkeitssätze verschiedener Finite-Elemente-Methoden erster Ordnung [Comparison theorems of various first-order FEM] (Diploma Thesis May 2012 in Berlin)

19. Dietmar Gallistl: Über nichtkonforme Finite-Elemente-Diskretisierungen der biharmonischen Gleichung [On nonconforming finite element discretisations of the biharmonic equation] (Diploma Thesis May 2012 in Berlin)

20. Johannes Neumann: Contributions to goal-oriented a posteriori error analysis for numerical PDEs (Diploma Thesis July 2012 in Berlin)

21. Alexander Eckert: A posteriori Fehleranalysis zur Arnold-Winther Finiten-Elemete-Methode in der Elastizitätstheorie [A posteriori error analysis of the Arnold-Winter FEM in elasticity] (Diploma Thesis July 2012 in Berlin)

22. Karoline Köhler: A nonconforming finite element method for the obstacle problem (Diploma Thesis March 2013 in Berlin)

23. Philip Morgenstern: Lokale Verfeinerung regulärer Triangulierungen in Vierecke [Local refinement of a regular triangulation into quadrilaterals] (Diploma Thesis April 2013 in Berlin)

24. Nora Graß: A mixed finite element method for the obstacle problem (Diploma Thesis June 2013 in Berlin)

25. Falk Dobers: Least-Squares-Elemente-Methoden für die Lineare Elastizität (Diploma Thesis Juli 2014 in Berlin)

26. Julian Zimmert: Kouhia-Stenberg FEM für Elasto-Plastizität (Diploma Thesis Juli 2014 in Berlin)

27. Boris Kraemer: Ein diskoninuierliches Galerkin-Verfahren für ein Optimal Design (Diploma Thesis November 2014 in Berlin)

28. Philipp Bringmann: Optimal mesh-refinement for incopressible fluid dynamics (Master Thesis December 2014 in Berlin)

29. Friederike Hellwig: Drei dPG-Methoden niedriger Ordung für Lineare Elastizität (Master Thesis December 2014 in Berlin, Humboldt Prize 2015)

30. Johannes Storn: Die Anwendung der dPG-Methode auf die zeitharmonischen Maxwell-Gleichungen (Master Thesis October 2015 in Berlin)

31. Sophie Puttkammer: Eine neue dPG-Finite-Elemente-Methode niedriger Ordnung für die Stokes Gleichungen (Master Thesis October 2015 in Berlin)

32. Alessandro Masacci: Nichtkonforme Finite-Elemente-Approximation eines Optimal-Design-Problems [Nonconforming FE approximation to an optimal design problem] (Master Thesis September 2016 in Berlin)

33. Nando Farchmin: A Discontinuous Petrov-Galerkin finite element method for a model problem in topology optimization (Master Thesis October 2017 in Berlin)

34. Stephan Daniel Schwöbel: Über den Zusammenhang von 4 dPG-FEM mit gewichteten LS-FEM (Master Thesis February 2018 in Berlin)

35. Ngoc Tien Tran: Non-standard discretisation of a class of degenerate convex minimisation problems (Master Thesis June 2018 in Berlin)

36. Lukas Gehring: The constant in the theorem of Binev-Dahmen-DeVore-Stevenson and a generalisation of it (Master Thesis April 2021 in Berlin)

37. Benedikt Gräßle: Conforming multilevel FEM for the biharmonic equation (Master Thesis August 2021 in Berlin)

38. Julian Streitberger: Discrete stability of dGFEM for biharmonic plates (Master Thesis December 2021 in Berlin)

39. Emilie Pirch: Computation of guaranteed lower eigenvalue bounds with a hybrid high-order method (Master Thesis January 2022 in Berlin)

Supervised PhDs and Habilitations

1. Jochen Alberty: Zeitdiskretisierungsverfahren elastoplastischer Probleme der Kontinuumsmechanik. [Time discretisation schemes for elastoplastic problems in continuum mechanics] (PhD 30.07.01 in Kiel)

2. Andreas Prohl: Numerical analysis in nonstationary micromagnetism and nematic liquid crystals. (Habilitation 14.11.01 in Kiel). Presently W3 Professor at University of Tübingen, Germany.

3. Sören Bartels: Numerical analysis of some non-convex variational problems. (PhD 17.12.01 in Kiel) Presently W3 Professor at University of Freiburg, Germany.

4. Jan Valdman: Mathematical and numerical analysis of elastoplastic material with multi-surface stress-strain relation. (PhD 25.02.02 in Kiel) Former Associate Professor at University of Iceland, presently Scientific leader at SPOMECH, VSB Technical University of Ostrava plus Associate Professor at University of South Bohemia, Czech Republic.

5. Stefan Funken: Beiträge zur a posteriori Fehlerabschätzung bei der numerischen Behandlung elliptischer partieller Differentialgleichungen -Theorie, Numerik und Anwendungen. [Contributions to a posteriori error estimation in the numerical treatment of elliptic PDEs -theory, numerics, and applications] (Habilitation 18.12.2002 in Kiel). Presently W3 Professor at University of Ulm, Germany.

6. Roland Klose: A posteriori Finite-Elemente-Analysis zur adaptiven Ortsdiskretisierung in der Elastoplastizität. [A Posteriori Finite Element Error Analysis in Elastoplasticty] (PhD 12.5.03 in Kiel)

7. Dirk Praetorius: Analysis, Numerik und Simulation eines relaxierten Modellproblemes zum Mikromagnetismus. [Analysis, numerics and simulation of a relaxed model problem in micromagnetism] (PhD 24.4.03 in Vienna). Presently Universitätsprofessor at Vienna University of Technology, Austria.

8. Axel Hecht: Adaptive Finite Elemente Methoden für ein elastoplastisches 7-Parameter-Zylinderschalenmodell. [Adaptive FEMs for an elastoplastic 7 parameter cylindric shell model.] (PhD 8.12.2003 in Kiel)

9. Darius Zarrabi: Beiträge zur Modellierung und Numerik elastoplastischer Kontaktprobleme. [Contributions to modelling and numerics of elastoplastic contact problems.] (PhD 12.01.2004 in Kiel)

10. Dirk Praetorius: Effective numerical treatment of the Landau-Lifshitz equation in relaxed micromagnetics. (Habilitation 01/2005 TU Vienna). Presently Universitätsprofessor at Vienna University of Technology, Austria.

11. Jelena Bojanić: Numerical analysis of the 1D satellite beam equation. (PhD June 2005 TU Vienna)

12. Karin Mautner: Numerical treatment of the Black-Scholes variational inequality in computational finance. (PhD December 2006 HU Berlin) Presently Professor at University of Applied Sciences Aachen, Germany.

13. Sören Bartels: Finite element approximation of harmonic maps between surfaces. (Habilitation December 2008 HU Berlin). Presently W3 Professor at University of Freiburg, Germany.

14. Joscha Gedicke: On the numerical analysis of eigenvalue problems, (PhD June 2013 HU Berlin, SIAM Student Paper Price 2013, Dr.-Klaus-Körper Prize 2014). Presently W3 Professor at University of Bonn, Germany.

15. Wolfgang Boiger: Stabilised Finite Element Approximation for Degenerate Convex Minimisation Problems, (PhD August 2013 HU Berlin).

16. Christian Merdon: Aspects of Guaranteed Error Control in CPDE, (PhD September 2013 HU Berlin).

17. Hella Rabus: On the quasi-optimal convergence of adaptive non-conforming finite element methods in three examples, (PhD April 2013 HU Berlin, 3. Place Dissertationspreis Adlershof 2014).

18. Dietmar Gallistl: Adaptive finite element computation of eigenvalues, (PhD July 2014 HU Berlin). Presently W3 Professor at Friedrich-Schiller-Universität Jena, Germany.

19. Mira Schedensack: A class of mixed finite element methods based on the Helmholtz decomposition in computational mechanics, (PhD June 2015 HU Berlin, Dr.-Klaus-Körper Prize 2016, Humboldt Prize in 2016, Marthe Vogt Award in 2016). Presently Juniorprofessor at University of Leipzig.

20. Karoline Köhler: On efficient a posteriori error analysis for variational inequalities, (PhD September 2016 HU Berlin).

21. Daniel Peterseim: Computational Multiscale Methods, (Habilitaion November 2016 HU Berlin). Presently Universitätsprofessor at University of Augsburg, Germany.

22. Friederike Hellwig: Adaptive discontinuous Petrov-Galerkin Finite-Element-Methods, (PhD November 2018 HU Berlin, Dr.-Klaus-Körper Prize 2019).

23. Johannes Storn: Topics in Least-Squares and Discontinuous Petrov-Galerkin Finite Element Analysis, (PhD July 2019 HU Berlin).

24. Philipp Bringmann: Adaptive least-squares finite element method with optimal convergence rates, (PhD January 2020 HU Berlin).

25. Ngoc Tien Tran: Unstabilized hybrid high-order method for a class of degenerate convex minimization problems, (PhD July 2021 HU Berlin).

26. Rekha Khot: Nonconforming virtual element method for linear elliptic boundary value problems, (PhD August 2022 IITB Mumbai).

27. Sophie Puttkammer: Direct guaranteed lower eigenvalue bounds with quasi-optimal adaptive mesh-refinement, (PhD January 2023 HU Berlin).

Other than the above postdoctoral research fellows include Antonio Orlando (2003–2006; now Professor at Universidad de Tucuman, Argentina), Max Jensen (2005–2006; now Associate Professor at University College London), Jun Hu (2004–2005; now Professor at Peking University) Gunar Matthies (2008–2009; now Professor Kassel University), Xie Xiaoping (2008–2009; now Professor at Sichuan University), Andreas Schröder (2007-2012; now Universitätsprofessor at University of Salzburg, Austria), D. Liu (2012; now Professor in Shanghai), Fleurianne Bertrand (2018–2020; now Professor at TU Chemnitz).

List of Publications

Books/Chapters in Books

C. Carstensen. Numerical analysis of microstructure. In J.P. Coleman J.F. Blowey and A.W. Craig, editors, *Theory and numerics of differential equations (Durham, 2000)*, Universitext, pages 59–126, Berlin, 2001. Springer-Verlag.

C. Carstensen, S. Bartels, K. Hackl, A. Orlando, R.H.W. Hoppe, and S. Conti. Relaxation and the computation of effective energies and microstructures in solid mechanics. In A. Mielke, editor, *Analysis, Modeling and Simulation of Multiscale Problems*, pages 197–224, Berlin, 2006. Springer-Verlag.

C. Carstensen. Lectures on adaptive mixed finite element methods. In *Mixed finite element technologies*, volume 509 of *CISM Courses and Lectures*, pages 1–56. Springer Wien New York, Vienna, 2009.

C. Carstensen, D. Gallistl, and B. Kraemer. Numerical algorithms for the simulation of finite plasticity with microstructures. In *Analysis and Computation of Microstructure in Finite Plasticity*, Lecture Notes in Applied and Computational Mechanics, pages 1–30. Springer, 2015.

C. Carstensen and S. C. Brenner. Finite element methods. In R. d. Borst E. Stein and T. J. R. Hughes, editors, *Encyclopedia of Computational Mechanics Second Edition*, pages 1–47. John Wiley and Sons, 2017.

P. Bringmann, C. Carstensen, and N. T. Tran. Adaptive least-squares, discontinuous Petrov-Galerkin, and hybrid high-order methods. In *Non-standard discretisation methods in solid mechanics*, volume 98 of *Lect. Notes Appl. Comput. Mech.*, pages 107–147. Springer, Cham, 2022.

Editorials

C. Carstensen, S.A. Funken, W. Hackbusch, R.H.W. Hoppe, P. Monk (Eds.): *Computational Electromagnetics*, Lecture Notes in Computational Science and Engineering **28** (2003) Springer-Verlag Berlin-Heidelberg.

C. Carstensen, N. Heuer, M. Maischak: Special issue: Boundary elements — theory and applications. Dedicated to Professor Ernst Stephan on the occasion of his 60th birthday. Appl. Numer. Math. 59 (2009) no. 11, 2695–2697.

P. Wriggers, C. Carstensen (Eds.): *Mixed Finite Element Technologies*, CISM Courses and Lectures **509** (2009) Springer Wien New York.

C. Carstensen, R. Rannacher, Z. Shi, T. Tang: Special issue for the 2nd Sino-German workshop on Computational and Applied Mathematics, held in Hangzhou, 2007, October 9-13 *J. Comput. Math.* **27** (2009) 115.

Published Papers

2024

C. Carstensen and S. Puttkammer. Adaptive guaranteed lower eigenvalue bounds with optimal convergence rates. *Numerische Mathematik*, 156(1):1–38, February 2024.

C. Carstensen, B. Gräßle, and N. Nataraj. A posteriori error control for fourth-order semilinear problems with quadratic nonlinearity. *SIAM J. Numer. Anal.*, 2024. In Press, arXiv:2309.08427.

C. Carstensen, B. Gräßle, and N. Nataraj. Unifying a posteriori error analysis of five piecewise quadratic discretisations for the biharmonic equation. *Journal of Numerical Mathematics*, 32 (1), 2024.

2023

F. Bertrand, C. Carstensen, B. Gräßle, and N. T. Tran. Stabilization-free HHO a posteriori error control. *Numerische Mathematik*, 154(3-4):369–408, August 2023.

C. Carstensen and S. Puttkammer. Direct guaranteed lower eigenvalue bounds with optimal a priori convergence rates for the bi-Laplacian. *SIAM J. Numer. Anal.*, 61(2):812–836, 2023.

C. Carstensen and M. Schedensack. Two discretisations of the time-dependent Bingham problem. *Numerische Mathematik*, 153(2):411–450, March 2023.

C. Carstensen, R. Khot, and A. K. Pani. Nonconforming Virtual Elements for the Biharmonic Equation with Morley Degrees of Freedom on Polygonal Meshes. *SIAM J. Numer. Anal.*, 61 (5):2460–2484, October 2023.

C. Carstensen, N. Nataraj, G. C. Remesan, and D. Shylaja. Unified a priori analysis of four second-order FEM for fourth-order quadratic semilinear problems. *Numerische Mathematik*, June 2023.

2022

P. Bringmann, C. Carstensen, and N. T. Tran. Adaptive least-squares, discontinuous Petrov-Galerkin, and hybrid high-order methods. In *Non-standard discretisation methods in solid mechanics*, volume 98 of *Lect. Notes Appl. Comput. Mech.*, pages 107–147. Springer, Cham, 2022.

C. Carstensen and N. Nataraj. Lowest-order equivalent nonstandard finite element methods for biharmonic plates. *ESAIM Math. Model. Numer. Anal.*, 56(1):41–78, 2022.

C. Carstensen and S. Sauter. Critical functions and inf-sup stability of Crouzeix-Raviart elements. *Comput. Math. Appl.*, 108:12–23, 2022.

C. Carstensen and S. Sauter. Crouzeix-Raviart triangular elements are inf-sup stable. *Math. Comp.*, 91(337):2041–2057, 2022.

C. Carstensen and N. T. Tran. Convergent adaptive hybrid higher-order schemes for convex minimization. *Numer. Math.*, 151(2):329–367, 2022.

C. Carstensen, R. Khot, and A. K. Pani. A priori and a posteriori error analysis of the lowest-order NCVEM for second-order linear indefinite elliptic problems. *Numer. Math.*, 151(3): 551–600, 2022.

C. Carstensen, N. Nataraj, and A. K. Pani. Stability of mixed FEMs for non-selfadjoint indefinite second-order linear elliptic PDEs. *Numer. Math.*, 150(4):975–992, 2022.

2021

C. Carstensen and R. Ma. Collective marking for arbitrary order adaptive least-squares finite element methods with optimal rates. *Comput. Math. Appl.*, 95:271–281, 2021.

C. Carstensen and R. Ma. Adaptive mixed finite element methods for non-self-adjoint indefinite second-order elliptic PDEs with optimal rates. *SIAM J. Numer. Anal.*, 59(2):955–982, 2021.

C. Carstensen and N. Nataraj. A Priori and a Posteriori Error Analysis of the Crouzeix–Raviart and Morley FEM with Original and Modified Right-Hand Sides. *Comput. Methods Appl. Math.*, 21(2):289–315, 2021.

C. Carstensen and N. Nataraj. Adaptive Morley FEM for the von Kármán equations with optimal convergence rates. *SIAM J. Numer. Anal.*, 59(2):696–719, 2021.

C. Carstensen and T. Tran. Unstabilized Hybrid High-order Method for a Class of Degenerate Convex Minimization Problems. *SIAM J. Numer. Anal.*, 59(3):1348–1373, 2021.

C. Carstensen, G. Mallik, and N. Nataraj. Nonconforming finite element discretization for semilinear problems with trilinear nonlinearity. *IMA J. Numer. Anal.*, 41(1):164–205, 2021.

Carsten Carstensen and Jun Hu. Hierarchical Argyris finite element method for adaptive and multigrid algorithms. *Comput. Methods Appl. Math.*, 21(3):529–556, 2021.

Carsten Carstensen, Alexandre Ern, and Sophie Puttkammer. Guaranteed lower bounds on eigenvalues of elliptic operators with a hybrid high-order method. *Numer. Math.*, 149(2): 273–304, 2021.

2020

C. Carstensen. Collective marking for adaptive least-squares finite element methods with optimal rates. *Math. Comp.*, 89(321):89–103, 2020.

C. Carstensen and S. Puttkammer. How to prove the discrete reliability for nonconforming finite element methods. *J. Comput. Math*, 38(1):142–175, 2020.

C. Carstensen, Q. Zhai, and R. Zhang. A skeletal finite element method can compute lower eigenvalue bounds. *SIAM J. Numer. Anal.*, 58(1):109–124, 2020.

2019

C. Carstensen, A. K. Dond, and H. Rabus. Quasi-optimality of adaptive mixed FEMs for non-selfadjoint indefinite second-order linear elliptic problems. *Comput. Methods Appl. Math.*, 19(2):233–250, 2019.

C. Carstensen, D. Gallistl, and J. Gedicke. Residual-based a posteriori error analysis for symmetric mixed Arnold-Winther FEM. *Numer. Math.*, 142(2):205–234, 2019.

C. Carstensen, D. Liu, and J. Alberty. Convergence of dG(1) in elastoplastic evolution. *Numer. Math.*, 141(3):715–742, Mar 2019.

C. Carstensen, G. Mallik, and N. Nataraj. A priori and a posteriori error control of discontinuous Galerkin finite element methods for the von Kármán equations. *IMA J. Numer. Anal.*, 39(1): 167–200, 2019.

2018

P. Bringmann, C. Carstensen, and G. Starke. An adaptive least-squares FEM for linear elasticity with optimal convergence rates. *SIAM J. Numer. Anal.*, 56(1):428–447, 2018.

C. Carstensen and F. Hellwig. Constants in discrete Poincaré and Friedrichs inequalities and discrete quasi-interpolation. *Comput. Methods Appl. Math.*, 18(3):433–450, 2018.

C. Carstensen and F. Hellwig. Optimal Convergence Rates for Adaptive Lowest-Order Discontinuous Petrov-Galerkin Schemes. *SIAM J. Numer. Anal.*, 56(2):1091–1111, 2018.

C. Carstensen and S. Puttkammer. A low-order discontinuous Petrov-Galerkin method for the Stokes equations. *Numer. Math.*, 140(1):1–34, 2018.

C. Carstensen and J. Storn. Asymptotic Exactness of the Least-Squares Finite Element Residual. *SIAM J. Numer. Anal.*, 56(4):2008–2028, 2018.

C. Carstensen, P. Bringmann, F. Hellwig, and P. Wriggers. Nonlinear discontinuous Petrov-Galerkin methods. *Numer. Math.*, 139(3):529–561, 2018.

C. Carstensen, A. K. Dond, N. Nataraj, and A. K. Pani. Three First-Order Finite Volume Element Methods for Stokes Equations under Minimal Regularity Assumptions. *SIAM J. Numer. Anal.*, 56(4):2648–2671, 2018.

C. Carstensen, D. Gallistl, and Y. Huang. Saturation and reliable hierarchical a posteriori Morley finite element error control. *J. Comput. Math.*, 36(6):833–844, 2018.

2017

P. Bringmann and C. Carstensen. h-adaptive least-squares finite element methods for the 2D Stokes equations of any order with optimal convergence rates. *Comput. Math. Appl.*, 74(8): 1923–1939, 2017.

P. Bringmann and C. Carstensen. An adaptive least-squares FEM for the Stokes equations with optimal convergence rates. *Numer. Math.*, 135(2):459–492, 2017.

C. Carstensen and K. Köhler. Nonconforming FEM for the obstacle problem. *IMA J. Numer. Anal.*, 37(1):64–93, 2017.

C. Carstensen and K. Köhler. Efficient discrete Lagrange multipliers in three first-order finite element discretizations for the a posteriori error control in an obstacle problem. *SIAM J. Numer. Anal.*, 55(1):349–375, 2017.

C. Carstensen and H. Rabus. Axioms of adaptivity with separate marking for data resolution. *SIAM J. Numer. Anal.*, 55(6):2644–2665, 2017.

C. Carstensen, F. Ebobisse, A. T. McBride, B. D. Reddy, and P. Steinmann. Some properties of the dissipative model of strain-gradient plasticity. *Philosophical Magazine*, 97(10):693–717, 2017.

C. Carstensen, E.-J. Park, and P. Bringmann. Convergence of natural adaptive least squares FEMs. *Numer. Math.*, 136(4):1097–1115, 2017.

2016

P. Bringmann, C. Carstensen, and C. Merdon. Guaranteed velocity error control for the pseudostress approximation of the Stokes equations. *Numer. Methods Partial Differential Equations*, 32(5):1411–1432, 2016.

C. Carstensen and J. Gedicke. Robust residual-based a posteriori Arnold–Winther mixed finite element analysis in elasticity. *Comput. Methods Appl. Mech. Engrg.*, 300:245–264, 2016.

C. Carstensen and F. Hellwig. Low-order discontinuous Petrov-Galerkin finite element methods for linear elasticity. *SIAM J. Numer. Math.*, 54(6):3388–3410, 2016.

C. Carstensen and M. Schedensack. Medius analysis and comparison results for first-order finite element methods in linear elasticity. *IMA J. Numer. Anal.*, 35:1591–1621, 2015.

C. Carstensen, L. Demkowicz, and J. Gopalakrishnan. Breaking spaces and forms for the DPG method and applications including Maxwell equations. *Comput. Math. Appl.*, 72(3):494–522, 2016.

C. Carstensen, A. K. Dond, N. Nataraj, and A. K. Pani. Error analysis of nonconforming and mixed FEMs for second-order linear non-selfadjoint and indefinite elliptic problems. *Numer. Math.*, 133(3):557–597, 2016.

C. Carstensen, D. Gallistl, and J. Gedicke. Justification of the saturation assumption. *Numer. Math.*, 134(1):1–25, 2016.

C. Carstensen, D. Gallistl, and M. Schedensack. L^2 best approximation of the elastic stress in the Arnold-Winther FEM. *IMA J. Numer. Anal.*, 36(3):1096–1119, 2016.

C. Carstensen, N. Nataraj, and A. K. Pani. Comparison results and unified analysis for first-order finite volume element methods for a Poisson model problem. *IMA J. Numer. Anal.*, 36(3): 1120–1142, 2016.

C. Carstensen, D. Peterseim, and A. Schröder. The norm of a discretized gradient in $H(\mathrm{div})^*$ for a posteriori finite element error analysis. *Numer. Math.*, 132:519–539, 2016.

C. Carstensen, B. D. Reddy, and M. Schedensack. A natural nonconforming FEM for the Bingham flow problem is quasi-optimal. *Numer. Math.*, 133:37–66, 2016.

C. Carstensen, A. Schröder, and S. Wiedemann. An optimal adaptive finite element method for elastoplasticity. *Numer. Math.*, 132:131–154, 2016.

2015

P. R. Bösing and C. Carstensen. Discontinuous Galerkin with weakly over-penalized techniques for Reissner-Mindlin plates. *Journal of Scientific Computing*, 64:401–424, 2015.

P. R. Bösing and C. Carstensen. Weakly over-penalized discontinuous Galerkin schemes for Reissner-Mindlin plates without the shear variable. *Numer. Math.*, 130:395–423, 2015.

C. Carstensen and G. Dolzmann. Convergence of adaptive finite element methods for a nonconvex double-well minimisation problem. *Math. Comp.*, 84:2111–2135, 2015.

C. Carstensen and J. Hu. An optimal adaptive finite element method for an obstacle problem. *Comput. Methods Appl. Math.*, 15:259–277, 2015.

C. Carstensen and D. J. Liu. Nonconforming FEMs for an optimal design problem. *SIAM J. Numer. Anal.*, 53:874–894, 2015.

C. Carstensen and E.-J. Park. Convergence and optimality of adaptive least squares finite element methods. *SIAM J. Numer. Anal.*, 53:43–62, 2015.

C. Carstensen, D. Gallistl, and N. Nataraj. Comparison results of nonstandard P_2 finite element methods for the biharmonic problem. *ESAIM Math. Model. Numer. Anal.*, pages 977–990, 2015.

C. Carstensen, D. Gallistl, and M. Schedensack. Adaptive nonconforming Crouzeix-Raviart FEM for eigenvalue problems. *Math. Comp.*, 84:1061–1087, 2015.

C. Carstensen, K. Köhler, D. Peterseim, and M. Schedensack. Comparison results for the Stokes equations. *Appl. Numer. Math.*, 95:118–129, 2015.

2014

W. Boiger and C. Carstensen. A posteriori error analysis of stabilised fem for degenerate convex minimisation problems under weak regularity assumptions. *Advanced Modeling and Simulation in Engineering Sciences*, 1(5), 2014.

C. Carstensen and D. Gallistl. Guaranteed lower eigenvalue bounds for the biharmonic equation. *Numer. Math.*, 126(1):33–51, 2014.

C. Carstensen and J. Gedicke. Guaranteed lower bounds for eigenvalues. *Math. Comp.*, 83(290): 2605–2629, 2014.

C. Carstensen and C. Merdon. Computational survey on a posteriori error estimators for the crouzeix-raviart nonconforming finite element method for the stokes problem. *Comput. Methods Appl. Math.*, 14(1):35–54, 2014.

C. Carstensen and C. Merdon. Refined fully explicit a posteriori residual-based error control. *SIAM J. Numer. Anal.*, 52(4):1709–1728, 2014.

C. Carstensen, L. Demkowicz, and J. Gopalakrishnan. A posteriori error control for DPG methods. *SIAM J. Numer. Anal.*, 52(3):1335–1353, 2014.

C. Carstensen, M. Feischl, M. Page, and D. Praetorius. Axioms of adaptivity. *Comput. Math. Appl.*, 67(6):1195–1253, 2014.

C. Carstensen, D. Gallistl, F. Hellwig, and L. Weggler. Low-order dPG-FEM for an elliptic PDE. *Comput. Math. Appl.*, 68(11):1503–1512, 2014.

C. Carstensen, D. Gallistl, and J. Hu. A discrete Helmholtz decomposition with Morley finite element functions and the optimality of adaptive finite element schemes. *Comput. Math. Appl.*, 68(12):2167–2181, 2014.

C. Carstensen, J. Gedicke, V. Mehrmann, and A. Miedlar. An adaptive finite element method with asymptotic saturation for eigenvalue problems. *Numer. Math.*, 2014.

J. Gedicke and C. Carstensen. A posteriori error estimators for convection–diffusion eigenvalue problems. *Comput. Methods Appl. Mech. Engrg.*, 268:160–177, 2014.

2013

C. Carstensen and C. Merdon. Computational survey on a posteriori error estimators for nonconforming finite element methods for the Poisson problem. *J. Comput. Appl. Math.*, 249: 74–94, 2013.

C. Carstensen and C. Merdon. Effective postprocessing for equilibration a posteriori error estimators. *Numer. Math.*, 123(3):425–459, 2013.

C. Carstensen and C. Merdon. A posteriori error estimator competition for conforming obstacle problems. *Numer. Methods Partial Differential Equations*, 29(2):667–692, 2013.

C. Carstensen, D. Gallistl, and J. Hu. A posteriori error estimates for nonconforming finite element methods for fourth-order problems on rectangles. *Numer. Math.*, 124(2):309–335, 2013.

C. Carstensen, D. Gallistl, and M. Schedensack. Discrete reliability for Crouzeix-Raviart FEMs. *SIAM J. Numer. Anal.*, 51(5):2935–2955, 2013.

C. Carstensen, D. Gallistl, and M. Schedensack. Quasi-optimal adaptive pseudostress approximation of the Stokes Equations. *SIAM J. Numer. Anal.*, 51(3):1715–1734, 2013.

C. Carstensen, D. Peterseim, and H. Rabus. Optimal adaptive nonconforming FEM for the Stokes problem. *Numer. Math.*, 123(2):291–308, 2013.

D. Peterseim and C. Carstensen. Finite element network approximation of conductivity in particle composites. *Numer. Math.*, 124(1):73–97, 2013.

2012

R. Altmann and C. Carstensen. P_1-nonconforming finite elements on triangulations into triangles and quadrilaterals. *SIAM J. Numer. Anal.*, 50(2):418–438, 2012.

C. Carstensen and J. Gedicke. An adaptive finite element eigenvalue solver of asymptotic quasi-optimal computational complexity. *SIAM J. Numer. Anal.*, 50(3):1029–1057, 2012. SIAM Student Paper Price 2013.

C. Carstensen and D. Praetorius. Convergence of adaptive boundary element methods. *J. Integral Equations Appl.*, 24(1):1–23, 2012.

C. Carstensen and D. Praetorius. Stabilisation yields strong convergence of macroscopic magnetisation vectors for micromagnetics without exchange energy. *J. Numer. Math.*, 20(2): 81–109, 2012.

C. Carstensen and H. Rabus. The adaptive nonconforming FEM for the pure displacement problem in linear elasticity is optimal and robust. *SIAM J. Numer. Anal.*, 50(3):1264–1283, 2012.

C. Carstensen, M. Eigel, R. H. W. Hoppe, and C. Löbhard. A review of unified a posteriori finite element error control. *Numer. Math. Theory Methods Appl.*, 5(4):509–558, 2012.

C. Carstensen, J. Gedicke, and E.-J. Park. Numerical experiments for the Arnold-Winther mixed finite elements for the Stokes problem. *SIAM J. Sci. Comput.*, 34(4):A2267–A2287, 2012.

C. Carstensen, J. Gedicke, and D. Rim. Explicit error estimates for Courant, Crouzeix-Raviart and Raviart-Thomas finite element methods. *J. Comput. Math.*, 30(4):337–353, 2012.

C. Carstensen, D. Günther, and H. Rabus. Mixed finite element method for a degenerate convex variational problem from topology optimization. *SIAM J. Numer. Anal.*, 50(2):522–543, 2012.

C. Carstensen, D. Peterseim, and M. Schedensack. Comparison results of finite element methods for the Poisson model problem. *SIAM J. Numer. Anal.*, 50(6):2803–2823, 2012.

2011

C. Carstensen and J. Gedicke. An oscillation-free adaptive FEM for symmetric eigenvalue problems. *Numer. Math.*, 118(3):401–427, 2011.

C. Carstensen and C. Merdon. Remarks on the state of the art of a posteriori error control of elliptic PDEs in energy norms in practise. *Stud. Univ. Babeş-Bolyai Math.*, 56(2):273–293, 2011.

C. Carstensen and H. Rabus. An optimal adaptive mixed finite element method. *Math. Comp.*, 80(274):649–667, April 2011.

C. Carstensen, M. Eigel, and J. Gedicke. Computational competition of symmetric mixed FEM in linear elasticity. *Comput. Methods Appl. Mech. Engrg.*, 200(41–44):2903–2915, 2011.

C. Carstensen, J. Gedicke, V. Mehrmann, and A. Miedlar. An adaptive homotopy approach for non-selfadjoint eigenvalue problems. *Numer. Math.*, 119(3):557–583, 2011.

C. Carstensen, R. H. W. Hoppe, N. Sharma, and T. Warburton. Adaptive hybridized interior penalty discontinuous Galerkin methods for H(curl)-elliptic problems. *Numer. Math. Theory Methods Appl.*, 4(1):13–37, 2011.

C. Carstensen, E.-J. Park, and D. Kim. A priori and a posteriori pseudostress-velocity mixed finite element error analysis for the Stokes problem. *SIAM J. Numer. Anal.*, 49(6):2501–2523, 2011.

C. Carstensen, X. Xie, G. Yu, and T. Zhou. A priori and a posteriori analysis for a locking-free low order quadrilateral hybrid finite element for Reissner Mindlin plates. *Comput. Methods Appl. Mech. Engrg.*, 200:1161–1175, 2011.

G. Yu, X. Xie, and C. Carstensen. Uniform convergence and a posteriori error estimation for assumed stress hybrid finite element methods. *Comput. Methods Appl. Mech. Engrg.*, 200 (29-32):2421–2433, 2011.

2010

W. Boiger and C. Carstensen. On the strong convergence of gradients in stabilised degenerate convex minimisation problems. *SIAM J. Numer. Anal.*, 47(6):4569–4580, 2010.

C. Carstensen and C. Merdon. Estimator competition for Poisson problems. *J. Comput. Math.*, 28(3):309–330, 2010.

C. Carstensen and C. Ortner. Analysis of a class of penalty methods for computing singular minimizers. *Comput. Methods Appl. Math.*, 10(2):137–163, 2010.

H. Rabus. A natural adaptive nonconforming FEM of quasi-optimal complexity. *Comput. Methods Appl. Math.*, 10(3):315–325, 2010.

2009

D. Braess, C. Carstensen, and R. H. W. Hoppe. Error reduction in adaptive finite element approximations of elliptic obstacle problems. *J. Comput. Math.*, 27(2-3):148–169, 2009.

C. Carstensen. Convergence of adaptive finite element methods in computational mechanics. *Appl. Numer. Math.*, 59(9):2119–2130, 2009.

C. Carstensen and R. H. W. Hoppe. Unified framework for an a posteriori error analysis of non-standard finite element approximations of H(curl)-elliptic problems. *J. Numer. Math.*, 17 (1):27–44, 2009.

C. Carstensen and J. Hu. Hanging nodes in the unifying theory of a posteriori finite element error control. *J. Comput. Math.*, 27(2-3):215–236, 2009.

C. Carstensen, T. Gudi, and M. Jensen. A unifying theory of a posteriori error control for discontinuous Galerkin FEM. *Numer. Math.*, 112(3):363–379, 2009.

C. Carstensen, N. Heuer, and M. Maischak. Preface: Special issue: Boundary elements—theory and applications. Dedicated to Professor Ernst P. Stephan on the occasion of his 60th birthday. *Appl. Numer. Math.*, 59(11):2695–2697, 2009.

C. Carstensen, R. Rannacher, Z. Shi, and T. Tang. Preface: Special Issue for "the 2nd Sino-German workshop on Computational and Applied Mathematics". *J. Comput. Math.*, 27(2-3): 115, 2009. Held in Hangzhou, October 9–13, 2007.

2008

C. Carstensen. Convergence of adaptive FEM for a class of degenerate convex minimization problems. *IMA J. Numer. Anal.*, 28(3):423–439, 2008.

C. Carstensen and J. Hu. A posteriori error analysis for conforming MITC elements for Reissner-Mindlin plate. *Math. Comp.*, 77(262):611–632, 2008.

C. Carstensen and J. Thiele. Partition of unity for localization in implicit a posteriori finite element error control for linear elasticity. *Internat. J. Numer. Methods Engrg.*, 73(1):71–95, 2008.

C. Carstensen, S. Conti, and A. Orlando. Mixed analytical-numerical relaxation in finite single-slip crystal plasticity. *Contin. Mech. Thermodyn.*, 20(5):275–301, 2008.

C. Carstensen, D. Günther, J. Reininghaus, and J. Thiele. The Arnold-Winther mixed FEM in linear elasticity. part I: Implementation and numerical verification. *Comput. Methods Appl. Mech. Engrg.*, 197:3014–3023, 2008.

2007

S. Bartels and C. Carstensen. A convergent adaptive finite element method for an optimal design problem. *Numer. Math.*, 108(3):359–385, 2007.

D. Braess, C. Carstensen, and R. H. W. Hoppe. Convergence analysis of a conforming adaptive finite element method for an obstacle problem. *J. Numer. Math.*, 107(3):455–471, 2007.

C. Carstensen and J. Hu. A unifying theory of a posteriori error control for nonconforming finite element methods. *Numer. Math.*, 107(3):473–502, 2007.

C. Carstensen and D. Praetorius. On stabilized models in micromagnetics. *Comput. Mech.*, 39 (5):663–672, 2007.

C. Carstensen, J. Hu, and A. Orlando. Framework for the a posteriori error analysis of nonconforming finite element. *SIAM J. Numer. Anal.*, 45(1):68–82, 2007.

Z.-P. Li and C. Carstensen. An averaging scheme for macroscopic numerical simulation of nonconvex minimization problems. *BIT*, 47(3):601–611, 2007.

2006

C. Carstensen. Reliable and efficient averaging techniques as universal tool for a posteriori finite element error control on unstructured grids. *IJNAM*, 3(3):333–347, 2006.

C. Carstensen and R. H. W. Hoppe. Error reduction and convergence for an adaptive mixed finite element method. *Math. Comp.*, 75(255):1033–1042, 2006.

C. Carstensen and R. H. W. Hoppe. Convergence analysis of an adaptive nonconforming finite element method. *Numer. Math.*, 103(2):251–266, 2006.

C. Carstensen and M. Jensen. Averaging techniques for reliable and efficient a posteriori finite element error control: Analysis and applications. *CONM*, 383:15–34, 2006.

C. Carstensen and J. Schöberl. Residual-based a posteriori error estimate for a mixed Reissner-Mindlin plate finite element method. *Numer. Math.*, 103(2):225–250, 2006.

C. Carstensen, S. Bartels, and A. Hecht. P2q2iso2d=2d isoparametric FEM in Matlab. *J. Comput. Appl. Math.*, 192(2):219–250, 2006.

C. Carstensen, R. Klose, and A. Orlando. Reliable and efficient equilibrated a posteriori error finite element error control in elastoplasticity and elastoviscoplasticity with hardening. *Comput. Methods Appl. Mech. Engrg.*, 195(19-22):2574–2598, 2006.

C. Carstensen, A. Orlando, and J. Valdman. A convergent adaptive finite element method for the primal problem of elastoplasticity. *Internat. J. Numer. Methods Engrg.*, 67(13):1851–1887, 2006.

C. Carstensen, N. Yan, and W. Liu. A posteriori FE error control for p-Laplacian by gradient recovery in quasi-norm. *Math. Comp.*, 75(256):1599–1616, 2006.

C. Carstensen, N. Yan, and W. Liu. A posteriori error estimates for finite element approximation of parabolic p-Laplacian. *SIAM J. Numer. Anal.*, 43(6):2294–2319, 2006.

2005

C. Bahriawati and C. Carstensen. Three Matlab implementations of the lowest-order Raviart-Thomas MFEM with a posteriori error control. *Comput. Methods Appl. Math.*, 5(4):333–361, 2005.

C. Carstensen. Ten remarks on nonconvex minimisation for phase transition simulations. *Comput. Methods Appl. Mech. Engrg.*, 194(2–5):169–193, 2005.

C. Carstensen. Estimation of higher Sobolev norm from lower order approximation. *SIAM J. Numer. Anal.*, 42(5):2136–2147, 2005.

C. Carstensen. A unifying theory of a posteriori finite element error control. *Numer. Math.*, 100 (4):617–637, 2005.

C. Carstensen and R. H. W. Hoppe. Convergence analysis of an adaptive edge finite element method for the 2D Eddy current equations. *J. Numer. Math.*, 13(1):19–32, 2005.

C. Carstensen and D. Praetorius. Numerical analysis for a macroscopic model in micromagnetics. *SIAM J. Numer. Anal.*, 42(6), 2005.

C. Carstensen and D. Praetorius. Effective simulation of a macroscopic model for stationary micromagnetics. *Comput. Methods Appl. Mech. Engrg.*, 194(2–5):531–548, 2005.

C. Carstensen and D. Praetorius. Averaging techniques for the effective numerical solution of Symm's integral equation of the first kind. *SIAM J. Sci. Comput.*, 27(4):1226–1260, 2005.

C. Carstensen, P. Causin, and R. Sacco. A posteriori dual-mixed adaptive finite element error control for Lamé and Stokes equations. *Numer. Math.*, 101(2):309–332, 2005.

C. Carstensen, R. Lazarov, and S. Tomov. Explicit and averaging a posteriori error estimates for adaptive finite volume methods. *SIAM J. Numer. Anal.*, 42(6):2496–2521, 2005.

C. Carstensen, J. Valdman, and M. Brokate. A quasi-static boundary value problem in multi-surface elastoplasticity: part 2 - numerical solution. *Math. Methods Appl. Sci.*, 28:881–901, 2005.

2004

S. Bartels and C. Carstensen. Averaging techniques yield reliable a posteriori finite element error control for obstacle problems. *Numer. Math.*, 99(2):225–249, 2004.

S. Bartels, C. Carstensen, and G. Dolzmann. Inhomogeneous Dirichlet conditions in a priori and a posteriori finite element error analysis. *Numer. Math.*, 99(1):1–24, 2004.

S. Bartels, C. Carstensen, K. Hackl, and U. Hoppe. Effective relaxation for microstructure simulations: algorithms and applications. *Comput. Methods Appl. Mech. Engrg.*, 193:5143–5175, 2004.

S. Bartels, C. Carstensen, P. Plecháč, and A. Prohl. Convergence for stabilisation of degenerately convex minimisation problems. *IFB*, 6(2):253–269, 2004.

M. Brokate, C. Carstensen, and J. Valdman. A quasi-static boundary value problem in multi-surface elastoplasticity. part 1: Analysis. *Math. Methods Appl. Sci.*, 27(14):1697–1710, 2004.

C. Carstensen. All first-order averaging techniques for a posteriori finite element error control on unstructured grids are efficient and reliable. *Math. Comp.*, 73(247):1153–1165, 2004.

C. Carstensen. An adaptive mesh-refining algorithm allowing for an H^1 stable L^2 projection onto Courant finite element spaces. *Constr. Approx.*, 20(4):549–564, 2004.

C. Carstensen. Some remarks on the history and future of averaging techniques in finite element error analysis. *ZAMM Z. Angew. Math. Mech.*, 84(1):3–21, 2004.

C. Carstensen and G. Dolzmann. An a priori error estimate for finite element discretizations in nonlinear elasticity for polyconvex materials under small loads. *Numer. Math.*, 97(1):67–80, 2004.

C. Carstensen and G. Dolzmann. Time-space discretization of the nonlinear hyperbolic system $u_{tt} = div(\sigma(Du) + Du_t)$. *SIAM J. Numer. Anal.*, 42(1):75–89, 2004.

C. Carstensen and M. O. Rieger. Young-measure approximations for elastodynamics with non-monotone stress-strain relations. *M2AN Math. Model. Numer. Anal.*, 38:397–418, 2004.

C. Carstensen and S.A. Sauter. A posteriori error analysis for elliptic PDEs on domains with complicated structures. *Numer. Math.*, 96(4):691–721, 2004.

C. Carstensen, M. Maischak, D. Praetorius, and E. P. Stephan. Residual-based a posteriori error estimate for hypersingular equation on surfaces. *Numer. Math.*, 97(3):397–425, 2004.

C. Carstensen, B. D. Reddy, and D. Braess. Uniform convergence and a posteriori error estimators for the enhanced strain finite element method. *Numer. Math.*, 96(3):461–479, 2004.

2003

C. Carstensen and J. Alberty. Averaging techniques for reliable a posteriori FE-error control in elastoplasticity with hardening. *Comput. Methods Appl. Mech. Engrg.*, 192(11–12):1435–1450, 2003.

C. Carstensen and K. Jochimsen. Adaptive finite element methods for microstructures? numerical experiments for a 2-well benchmark. *Computing*, 71:175–204, 2003.

C. Carstensen and R. Klose. A posteriori finite element error control for the p-Laplace problem. *SIAM J. Sci. Comput.*, 25:792–814, 2003.

C. Carstensen and D. Praetorius. A posteriori error control in adaptive qualocation boundary element analysis for a logarithmic-kernel integral equation of the first kind. *SIAM J. Sci. Comput.*, 25(1):253–283, 2003.

C. Carstensen and K. Weinberg. An adaptive non-conforming finite-element method for Reissner-Mindlin plates. *Internat. J. Numer. Methods Engrg.*, 56(15):2313–2330, 2003.

2002

J. Alberty and C. Carstensen. Discontinuous Galerkin time discretization in elastoplasticity: motivation, numerical algorithms, and applications. *Comput. Methods Appl. Mech. Engrg.*, 191(43):4949–4968, 2002.

J. Alberty, C. Carstensen, S. A. Funken, and R. Klose. Matlab implementation of the finite element method in elasticity. *Computing*, 69(3):239–263, 2002.

S. Bartels and C. Carstensen. Each averaging technique yields reliable a posteriori error control in FEM on unstructured grids. part II: Higher order FEM. *Math. Comp.*, 71(239):971–994, 2002.

C. Carstensen. Residual-based a posteriori error estimate for a nonconforming Reissner-Mindlin plate finite element. *SIAM J. Numer. Anal.*, 39(6):2034–2044, 2002.

C. Carstensen. Merging the Bramble-Pasciak-Steinbach and the Crouzeix-Thomée criterion for H^1-stability of the L^2-projection onto finite element spaces. *Math. Comp.*, 71(237):157–163, 2002.

C. Carstensen and S. Bartels. Each averaging technique yields reliable a posteriori error control in FEM on unstructured grids part I: Low order conforming, nonconforming, and mixed FEM. *Math. Comp.*, 71(239):945–969, 2002.

C. Carstensen and R. Klose. Elastoviscoplastic finite element analysis in 100 lines of Matlab. *J. Numer. Math.*, 10(3):157–192, 2002.

C. Carstensen and S. Müller. Local stress regularity in scalar nonconvex variational problems. *SIAM J. Math. Anal.*, 34(2):495–509, 2002.

C. Carstensen and B.P. Rynne. A posteriori error control for finite element approximations of the integral equation for thin wire antennas. *ZAMM Z. Angew. Math. Mech.*, 82(4):284–288, 2002.

C. Carstensen, S. Bartels, and S. Jansche. A posteriori error estimates for nonconforming finite element methods. *Numer. Math.*, 92(2):233–256, 2002.

C. Carstensen, C. Carstensen, and A. v. Döllen. Numerische Schwingungssimulation – Modellierung und Algorithmen. *Math. Semesterber.*, 48(2):193–210, 2002. In German.

C. Carstensen, K. Hackl, and A. Mielke. Non-convex potentials and microstructures in finite-strain plasticity. *R. Soc. Lond. Proc. Ser. A Math. Phys. Eng. Sci.*, 458(2018):299–317, 2002.

2001

C. Carstensen and B. Faermann. Mathematical foundation of a posteriori error estimates and adaptive mesh-refining algorithms for boundary integral equations of the first kind. *EABE*, 25(7):497–509, 2001.

C. Carstensen and S. A. Funken. Averaging technique for a posteriori error control in elasticity. part III: Locking-free nonconforming FEM. *Comput. Methods Appl. Mech. Engrg.*, 191(8–10): 861–877, 2001.

C. Carstensen and S. A. Funken. Averaging technique for FE-a posteriori error control in elasticity. part I: Conforming fem. *Comput. Methods Appl. Mech. Engrg.*, 190(18–19):2483–2498, 2001.

C. Carstensen and S. A. Funken. A posteriori error control in low-order finite element discretisations of incompressible stationary flow problems. *Math. Comp.*, 70(236):1353–1381, 2001.

C. Carstensen and S. A. Funken. Averaging technique for FE-a posteriori error control in elasticity. part II: λ-independent estimates. *Comput. Methods Appl. Mech. Engrg.*, 190(35–36): 4663–4675, 2001.

C. Carstensen and P. Plecháč. Numerical analysis of a relaxed variational model of hysteresis in two-phase solids. *M2AN Math. Model. Numer. Anal.*, 35:865–878, 2001.

C. Carstensen and A. Prohl. Numerical analysis of relaxed micromagnetics by penalised finite elements. *Numer. Math.*, 90(1):65–99, 2001.

C. Carstensen and K. Weinberg. Adaptive mixed finite element method for Reissner-Mindlin plate. *Comput. Methods Appl. Mech. Engrg.*, 190(51–52):6895–6908, 2001.

C. Carstensen, S. Bartels, and R. Klose. An experimental survey of a posteriori Courant finite element error control for the Poisson equation. *Adv. Comput. Math.*, 15(1–4):79–106, 2001.

C. Carstensen, M. Maischak, and E. P. Stephan. A posteriori error estimate and h-adaptive algorithm on surfaces for Symm's integral equation. *Numer. Math.*, 90(2):197–213, 2001.

2000

J. Alberty and C. Carstensen. Numerical analysis of time-depending primal elastoplasticity with hardening. *SIAM J. Numer. Anal.*, 37(4):1271–1294, 2000.

C. Carstensen and S. A. Funken. Coupling of mixed finite elements and boundary elements. *IMA J. Numer. Anal.*, 20(3):461–480, 2000.

C. Carstensen and S. A. Funken. Constants in Clément-interpolation error and residual based a posteriori estimates in finite element methods. *East-West J. Numer. Math.*, 8(3):153–175, 2000.

C. Carstensen and P. Plecháč. Numerical analysis of compatible phase transitions in elastic solids. *SIAM J. Numer. Anal.*, 37(6):2061–2081, 2000.

C. Carstensen and T. Roubíček. Numerical approximation of Young measures in non-convex variational problems. *Numer. Math.*, 84(3):395–415, 2000.

C. Carstensen and K. Weinberg. Calculating the energy-norm FEM-error for Reissner-Mindlin plates without known reference solution. *Comput. Mech.*, 26(6):566–570, 2000.

C. Carstensen, G. Dolzmann, S. A. Funken, and D. S. Helm. Locking-free mixed finite element methods in linear elasticity. *Comput. Methods Appl. Mech. Engrg.*, 190(13–14):1701–1781, 2000.

1999

J. Alberty, C. Carstensen, and S. A. Funken. Remarks around 50 lines of Matlab: short finite element implementation. *Numer. Algorithms*, 20(2–3):117–137, 1999.

J. Alberty, C. Carstensen, and D. Zarrabi. Adaptive numerical analysis in primal elastoplasticity with hardening. *Comput. Methods Appl. Mech. Engrg.*, 171(3–4):175–204, 1999.

J. M. Ball and C. Carstensen. Compatibility conditions for microstructures and the austenite-martensite transition. *MSE*, 273–275:231–236, 1999.

C. Carstensen. Quasi-interpolation and a posteriori error analysis in finite element methods. *M2AN Math. Model. Numer. Anal.*, 33(6):1187–1202, 1999.

C. Carstensen. Numerical analysis of the primal problem of elastoplasticity with hardening. *Numer. Math.*, 82(4):577–597, 1999.

C. Carstensen and S. A. Funken. Fully reliable localized error control in the FEM. *SIAM J. Sci. Comput.*, 21(4):1465–1484 (electronic), 1999.

C. Carstensen and S. A. Funken. Coupling of nonconforming finite elements and boundary elements. I: A priori estimates. *Computing*, 62(3):229–241, 1999.

C. Carstensen and S. A. Funken. Coupling of nonconforming finite elements and boundary elements. II. A posteriori estimates and adaptive mesh-refinement. *Computing*, 62(3):243–259, 1999.

C. Carstensen and J. Gwinner. A theory of discretization for nonlinear evolution inequalities applied to parabolic Signorini problems. *Ann. Mat. Pura Appl. (4)*, 177:363–394, 1999.

C. Carstensen and R. Verfürth. Edge residuals dominate a posteriori error estimates for low order finite element methods. *SIAM J. Numer. Anal.*, 36(5):1571–1587, 1999.

C. Carstensen, O. Scherf, and P. Wriggers. Adaptive finite elements for elastic bodies in contact. *SIAM J. Sci. Comput.*, 20(5):1605–1626, 1999.

1998

C. Carstensen and G. Dolzmann. A posteriori error estimates for mixed FEM in elasticity. *Numer. Math.*, 81(2):187–209, 1998.

C. Carstensen and P. Plecháč. Adaptive algorithms for scalar non-convex variational problems. *Appl. Numer. Math.*, 26(1–2):203–216, 1998.

C. Carstensen, M. Kuhn, and U. Langer. Fast parallel solvers for symmetric boundary element domain decomposition equations. *Numer. Math.*, 79(3):321–347, 1998.

1997

J. M. Ball and C. Carstensen. Nonclassical austenite-martensite interfaces. *J. Phys.*, 7(C5): 35–40, 1997.

C. Carstensen. Domain decomposition for a non-smooth convex minimization problem and its application to plasticity. *Numer. Linear Algebra Appl.*, 4(3):177–190, 1997.

C. Carstensen. A posteriori error estimate for the mixed finite element method. *Math. Comp.*, 66(218):465–476, 1997.

C. Carstensen. An a posteriori error estimate for a first kind integral equation. *Math. Comp.*, 66(217):139–155, 1997.

C. Carstensen and J. Gwinner. FEM and BEM coupling for a nonlinear transmission problem with Signorini contact. *SIAM J. Numer. Anal.*, 34(5):1845–1864, 1997.

C. Carstensen and P. Plecháč. Numerical solution of the scalar double-well problem allowing microstructure. *Math. Comp.*, 66(219):997–1026, 1997.

C. Carstensen and E. P. Stephan. Adaptive boundary-element methods for transmission problems. *J. Austral. Math. Soc. Ser. B*, 38(3):336–367, 1997.

C. Carstensen and P. Wriggers. On the symmetric boundary element method and the symmetric coupling of boundary elements and finite elements. *IMA J. Numer. Anal.*, 17(2):201–238, 1997.

C. Carstensen, S. A. Funken, and E. P. Stephan. On the adaptive coupling of FEM and BEM in 2-d-elasticity. *Numer. Math.*, 77(2):187–221, 1997.

1996

B. Beckermann and C. Carstensen. Qd-type algorithms for the nonnormal Newton-Padé approximation table. *Constr. Approx.*, 12(3):307–329, 1996.

U. Brink, C. Carstensen, and E. Stein. Symmetric coupling of boundary elements and Raviart-Thomas-type mixed finite elements in elastostatics. *Numer. Math.*, 75(2):153–174, 1996.

C. Carstensen. Coupling of FEM and BEM for interface problems in viscoplasticity and plasticity with hardening. *SIAM J. Numer. Anal.*, 33(1):171–207, 1996.

C. Carstensen. A posteriori error estimate for the symmetric coupling of finite elements and boundary elements. *Computing*, 57(4):301–322, 1996.

C. Carstensen. Efficiency of a posteriori BEM-error estimates for first-kind integral equations on quasi-uniform meshes. *Math. Comp.*, 65(213):69–84, 1996.

C. Carstensen and E. P. Stephan. Adaptive boundary element methods for some first kind integral equations. *SIAM J. Numer. Anal.*, 33(6):2166–2183, 1996.

C. Carstensen, S. A. Funken, and E. P. Stephan. A posteriori error estimates for hp–boundary element methods. *Appl.Anal.*, 61(3–4):233–253, 1996.

C. Carstensen, D. Zarrabi, and E. P. Stephan. On the h-adaptive coupling of FE and BE for viscoplastic and elastoplastic interface problems. *J. Comput. Appl. Math.*, 75(2):345–363, 1996.

1995

C. Carstensen and T. Sakurai. Simultaneous factorization of a polynomial by rational approximation. *J. Comput. Appl. Math.*, 61(2):165–178, 1995.

C. Carstensen and E. P. Stephan. Interface problems in elastoviscoplasticity. *Quart. Appl. Math.*, 53(4):633–655, 1995.

C. Carstensen and E. P. Stephan. Adaptive coupling of boundary elements and finite elements. *RAIRO Model. Math. Anal. Numer.*, 29(7):779–817, 1995.

C. Carstensen and E. P. Stephan. Coupling of FEM and BEM for a nonlinear interface problem: the h-p version. *Numer. Methods Partial Differential Equations*, 11(5):539–554, 1995.

C. Carstensen and E. P. Stephan. A posteriori error estimates for boundary element methods. *Math. Comp.*, 64(210):483–500, 1995.

C. Carstensen, G. Mühlbach, and G. Schmidt. De Casteljau's algorithm is an extrapolation method. *Comput. Aided Geom. Design*, 12(4):371–380, 1995.

C. Carstensen, M. S. Petković, and M. Trajkovíc. Weierstrass formula and zero-finding methods. *Numer. Math.*, 69(3):353–372, 1995.

C. Carstensen, E. P. Stephan, and D. Estep. h-adaptive boundary element schemes. *Comput. Mech.*, 15(4):372–383, 1995.

1994

C. Carstensen. Interface problems in viscoplasticity and plasticity. *SIAM J. Math. Anal.*, 25(6): 1468–1487, 1994.

C. Carstensen. A note on simultaneous rootfinding for algebraic, exponential and trigonometric polynomials. *Comput. Math. Appl.*, 27(7):7–14, 1994.

C. Carstensen and M. S. Petković. On root finding methods with corrections. *Serdica*, 20(2): 148–157, 1994.

C. Carstensen and M. S. Petković. An improvement of Gargantini's simultaneous inclusion method for polynomial roots by Schröder's correction. *Appl. Numer. Math.*, 13(6):453–468, 1994.

E. Stein, B. Seifert, S. Ohnimus, and C. Carstensen. Adaptive finite element analysis of geometrically non-linear plates and shells, especially buckling. *Internat. J. Numer. Methods Engrg.*, 37(15):2631–2655, 1994.

1993

B. Beckermann and C. Carstensen. Global identities in the non-normal Newton-Padé approximation table. *J. Approx. Theory*, 74(2):199–220, 1993.

C. Carstensen. An interface problem in solid mechanics with a linear elastic and a hyperelastic material. *Math. Nachr.*, 163:269–279, 1993.

C. Carstensen. Interface problems in holonomic elastoplasticity. *Math. Methods Appl. Sci.*, 16 (11):819–835, 1993.

C. Carstensen. On quadratic-like convergence of the means for two methods for simultaneous rootfinding of polynomials. *BIT*, 33(1):64–73, 1993.

C. Carstensen and M. S. Petković. On some interval methods for algebraic, exponential and trigonometric polynomials. *Computing*, 51(3–4):313–326, 1993.

C. Carstensen and M. S. Petković. Some improved inclusion methods for polynomial roots with Weierstraß' corrections. *Comput. Math. Appl.*, 25(3):59–67, 1993.

C. Carstensen and M. S. Petković. On iteration methods without derivatives for the simultaneous determination of polynomial zeros. *J. Comput. Appl. Math.*, 45(3):251–266, 1993.

C. Carstensen and M. Reinders. On a class of higher-order methods for simultaneous root finding of generalized polynomials. *Numer. Math.*, 64(1):69–84, 1993.

C. Carstensen and W. Wagner. Detecting symmetry-breaking bifurcation points of symmetric structures. *Internat. J. Numer. Methods Engrg.*, 36(17):3019–3039, 1993.

C. Carstensen and P. Wriggers. On pertubation behaviour in non-linear dynamics. *Comm. Numer. Methods Engrg.*, 9:165–175, 1993.

1992

B. Beckermann and C. Carstensen. A reliable modification of the cross rule for rational Hermite interpolation. *Numer. Algorithms*, 3(1–4):29–44, 1992.

C. Carstensen. On simultaneous factoring of a polynomial. *Internat. J. Comput. Math.*, 46: 51–61, 1992.

C. Carstensen. On Grau's method for simultaneous factorization of polynomials. *SIAM J. Numer. Anal.*, 29(2):601–613, 1992.

C. Carstensen and G. Mühlbach. The Neville-Aitken formula for rational interpolants with prescribed poles. *Numer. Algorithms*, 3(1–4):133–141, 1992.

P. Wriggers and C. Carstensen. An efficient algorithm for the computation of stability points of dynamical systems under step load. *Engrg. Comp.*, 9(6):669–679, 1992.

1991

C. Carstensen. Inclusion of the roots of a polynomial based on Gerschgorin's theorem. *Numer. Math.*, 59(4):349–360, 1991.

C. Carstensen. Anwendungen von Begleitmatrizen (Applications of companion matrices). *Z. Angew. Math. Mech.*, 71(6):T809–T812, 1991. Bericht über die Wissenschaftliche Jahrestagung der GAMM (Hannover, 1990), in German.

C. Carstensen. Linear construction of companion matrices. *Linear Algebra Appl.*, 149:191–214, 1991.

1990

C. Carstensen. On a general rho-algorithm. *J. Comput. Appl. Math.*, 33(1):61–71, 1990.

1989

C. Carstensen and E. Stein. Über die Falksche ECP-Transformation und Verallgemeinerungen (on Falk's ECP transformation and generalizations). *ZAMM Z. Angew. Math. Mech.*, 69(11): 375–391, 1989.

Proceedings

C. Carstensen and E. Stein. Analysis und Berechnung der Falk'schen ECP-Transformation und verwandte Probleme (Analysis and computation of Falk's ECP transformation and related problems). In *Numerical treatment of eigenvalue problems, Vol. 4 (Oberwolfach, 1986)*, volume 83 of *Internat. Schriftenreihe Numer. Math.*, pages 47–61. Birkhäuser, Basel, 1987.

C. Carstensen. On a general epsilon algorithm. In C. Brezinski, editor, *Numerical and Applied Mathematics*, pages 437–441, Basel, 1989. IMACS.

P. Wriggers, O. Scherf, and C. Carstensen. Adaptive techniques for the contact of elastic bodies. In O. C. Zienkiewicz T. J. R. Hughes, E. Onate, editor, *Recent Developments in Finite Element Analysis*, pages 78–86, Barcelona, 1994. International Center for Numerical Methods in Engineering (CIMNE).

C. Carstensen. Numerical analysis of nonconvex minimization problems allowing microstructures. In K. Kozel. M. Feistauer, R. Rannacher, editor, *Numerical Modeling in Continuum Mechanics*, Prague, 1995a. Faculty of Mathematics and Physics, Charles University. Proceedings of the 2nd Summer Conference held in Prague 22–25 August 1994.

C. Carstensen and M. S. Petković. On a real measure of convergence of single step methods. In Lj. Cvetković D. Herceg, editor, *IX Conference on Applied Mathematics*, pages 101–110, Novi Sad, 1995. Institute of Mathematics. Budva, 1994.

P. Wriggers, O. Scherf, and C. Carstensen. An adaptive finite element method for frictionless contact problems. *ZAMM Z. Angew. Math. Mech.*, 75(1):37–40, 1995.

C. Carstensen. Adaptive boundary element methods and adaptive finite element and boundary element coupling. In S. Nicaise M. Costabel, M. Dauge, editor, *Boudary Value Problems and Integral Equations on Non-Smooth Domains*, volume 167, pages 47–58, New York, 1995b. Dekker. Lecture Notes in Pure and Applied Mathematics.

C. Carstensen and D. Zarrabi. An a posteriori error estimate for the unsymmetric coupling of FEM and BEM. In G. Wittum W. Hackbusch, editor, *Numerical Treatment of Coupled Systems. Notes on Numerical Fluid Mechanics.*, volume 51, pages 25–36, Braunschweig, Wiesbaden, Germany, January 20–22 1995. Vieweg-Verlag. Proceedings of the 11th GAMM–Seminar Kiel.

C. Carstensen. Numerical analysis of nonconvex minimization problems allowing microstructures. *ZAMM Z. Angew. Math. Mech.*, 76(2):497–498, 1996.

C. Carstensen and S. Jansche. A posteriori error estimates and adaptive algorithms for mixed and non-conform FEM. In K. Kozel. M. Feistauer, R. Rannacher, editor, *Numerical Modeling in Continuum Mechanics*, pages 187–195, 1997. Proceedings of the 3rd Summer Conference held in Prague, 8-11 September 1997.

C. Carstensen. Numerical analysis of the (relaxed) double well problem. In H. G. Bock et al., editor, *ENUMATH 97*, pages 230–237, Singapore, New Jersey, Sept. 28 – Oct. 3, 1997 1997. World Scientific Publishing. Proceedings of the 2nd European Conference on Numerical Mathematics and Advanced Applications, Heidelberg.

C. Carstensen and S. Jansche. An a posteriori estimate for nonconforming finite element methods. *ZAMM Z. Angew. Math. Mech.*, 78(3):871–872, 1998.

C. Carstensen and S. A. Funken. Fully reliable error control in the h-p-version of FEM. *ZAMM Z. Angew. Math. Mech.*, 79(1):135–138, 1999.

C. Carstensen, W. Hackbusch, and M. B. Luskin. Numerics of microstructures. *MFO Tagungsbericht*, 17, 1999.

C. Carstensen and A. Prohl. Numerical analysis of a relaxed model in micromagnetics. *ZAMM Z. Angew. Math. Mech.*, 80(3):821–822, 2000.

A. Hecht, C. Carstensen, and D. Zarrabi. Adaptive discretisation of shell problems. *ZAMM Z. Angew. Math. Mech.*, 80(S2):517–518, 2000.

K. Weinberg and C. Carstensen. Adaptive mixed finite element method for Reissner-Mindlin plates. *ZAMM Z. Angew. Math. Mech.*, 80(S2):559–560, 2000.

C. Carstensen and K. Hackl. On microstructures occuring in a model of finite–strain elastoplasticity involving a single slip–system. *ZAMM Z. Angew. Math. Mech.*, 80(S2):421–422, 2000.

C. Carstensen, J. Alberty, and D. Zarrabi. Numerical analysis of primal elastoplasticity with hardening. *ZAMM Z. Angew. Math. Mech.*, 80(3):831–832, 2000.

S. Bartels, C. Carstensen, and P. Plecháč. Finite element computation of macroscopic quantities in nonconvex minimisation problems and applications in materials science. In W. L. Wendland A.-M. Sändig, W. Schiehlen, editor, *Multifield problems. State of the Art.*, pages 69–79, Berlin, 2000. Springer.

D. N. Arnold, C. Carstensen, and R. H. W. Hoppe. Mixed finite element mehtods and applications. *MFO reports*, 5, 2001.

C. Carstensen, W. Hackbusch, and T. Y. Hou. Numerik von Mikrostrukturen. *MFO reports*, 25, 2001.

C. Carstensen. Nonconvex energy minimisation and relaxation in computational material science. In C. Miehe, editor, *IUTAM Symposium on Computational Mechanics of Solid State Materials at Large Strains*, The Netherlands, 2003. Kluwer Academic Publishers.

C. Carstensen and D. Praetorius. On stabilized models in micromagnetics. *ECCOMAS*, 2, 2004.

C. Carstensen. Numerische Lösungsverfahren für nichtkonvexe Probleme der Elastoplastizität. In F. G. Kollmann / G. Goittstein, editor, *Weitab vom Hookeschen Gesetz - Moderne Ansätze und Ingenieurpraxis grosser inelastischer Deformationen metallischer Werkstoffe, Vorträge des Symposiums vom 12.10.2004*, Mainz, 2005. Akademie der Wissenschaften und der Literatur.

D. Braess, C. Carstensen, and K. Hackl. Gemischte und nicht-standard Finite-Elemente-Methoden mit Anwendungen. *MFO reports*, 5, 2005.

C. Carstensen and A. Orlando. Convergence of adaptive finite element methods in elastoplasticity. *PAMM*, 5(1):829–830, 2005.

M. Ainsworth, C. Carstensen, and W. Dörfler. Convergence of adaptive algorithms. *MFO reports*, 37, 2005.

C. Carstensen, S. Bartels, K. Hackl, A. Orlando, R. H. W. Hoppe, and S. Conti. Relaxation and the computation of effective energies and microstructures in solid mechanics. In A. Mielke, editor, *Analysis, Modeling and Simulation of Multiscale Problems*, pages 197–224, Berlin, 2006. Springer-Verlag.

C. Carstensen. A note on matrix methods for location of the zeros of polynomials. *Facta Univ. Ser. Math. Inform.*, 28(4):373–378, 2013.

C. Carstensen, M. Feischl, and D. Praetorius. Rate optimality of adaptive algorithms. *ECCOMAS*, pages 20–24, 2014.

C. Carstensen and D. Praetorius. Averaging techniques for a posteriori error control in finite element and boundary element analysis. In O. Steinbach M. Schanz, editor, *Boundary Element Analysis*, volume 29, pages 29–59. Springer, 2007.

C. Carstensen and J. Bolte. Adaptive finite element mesh-refining algorithm for L^2-error control. In M. Ng W.-B. Liu and Zhong-Ci Shi, editors, *Recent Progress in Scientific Computing*, pages 13–39. Science Press, 2007.

C. Carstensen, J. Gedicke, and I. Livshits. A posteriori error analysis for eigenvalue problems. *PAMM*, 7(1):1026203–1026204, 2007a.

C. Carstensen, S. C. Brenner, and P. Monk. Nonstandard finite element methods. Abstracts from the workshop held 2008, august 10-16. *MFO reports*, 5(3):2027–2093, 2008.

C. Carstensen and R. Huth. Computational challenges in finite plasticity from a mathematical view point. *Adelaide, Australia*, ICTAM2008 Abstract Book and CD-ROM Proceedings, 2008.

J. C. Aurich, D. Biermann, H. Blum, C. Brecher, C. Carstensen, B. Denkena, F. Klocke, M. Kröger, P. Steinmann, and K. Weinert. Modelling and simulation of process - machine interaction in grinding. *Production Engineering*, 3(1):111–120, 2009.

C. Carstensen. Some remarks on the convergence of adaptive FEMs. *Proceedings of the Korean Society of Industrial and Applied Mathematics*, 4(2):11–16, November 2009.

C. Carstensen and B. Engquist. Computational multiscale methods, abstract from workshop held June 14-20. *MFO reports*, 6(2), 2009.

C. Carstensen. Sensitivity analysis of statistical measure for the reconstruction of microstructures based on the minimization of generalized least-square functionals. *Proceedings of the 3rd GAMM-Seminar on Multiscale Material Modelling*, Technische Mechanik Band 30(4), June 26-27 2010.

C. Carstensen, C. Merdon, and J. Neumann. Aspects of guaranteed error control in CPDEs. In *Numerical Solution of Partial Differential Equations: Theory, Algorithms, and Their Applications*, volume 45 of *Springer Proceedings in Mathematics & Statistics*, pages 103–119. Springer New York, 2013.

J. Gedicke and C. Carstensen. Quasi-optimal convergence and computational complexity of the adaptive finite element method for symmetric elliptic eigenvalue problems. In *Linear and Nonlinear Eigenproblems for PDEs*, volume 37 of *Mathematisches Forschungsinstitut Oberwolfach. Report*, pages 263–265, 2009.

W. Boiger and C. Carstensen. Strong convergence in stabilised degenerate convex problems. In *79th Annual Meeting of the International Association of Applied Mathematics and Mechanics (GAMM), Bremen 2008*, volume 8 of *Proceedings in Applied Mathematics and Mechanics*, pages 10839–10840. WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim, 2008.

C. Carstensen and H. Rabus. New adaptive mixed finite element method (AMFEM). *PAMM*, 8 (1):10049–10052, 2008.

C. Carstensen, D. Praetorius, and W. Boiger. Strong convergence for large bodies in micromagnetics. In *Special Issue: Sixth International Congress on Industrial Applied Mathematics (ICIAM07) and GAMM Annual Meeting, Zürich 2007*, volume 7 of *Proceedings in Applied Mathematics and Mechanics*, pages 1151203–1151204. WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim, 2007b.

J. M. Ball and C. Carstensen. Geometry of polycrystals and microstructure. *MATEC Web of Conferences*, 33:6, 2015 (published online).

P. Bringmann, C. Carstensen, D. Gallistl, F. Hellwig, D. Peterseim, S. Puttkammer, H. Rabus, and J. Storn. Towards adaptive discontinuous Petrov-Galerkin methods. *Proc. in Appl. Math. and Mech.*, 2016.