

# ASS.-PROF. DR. LOTHAR BANZ

Paris Lodron University of Salzburg  
Department of Mathematics  
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## PERSONAL INFORMATION

Date of Birth: 12.08.1985  
Place of Birth: Hannover  
Citizenship: German

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## PROFESSIONAL EXPERIENCE

since 10/2014 **Assistant Professor (Tenure Track)**  
Department of Mathematics, Paris Lodron Universität Salzburg, Salzburg, Austria

10/2013–09/2014 **Research Assistant (PostDoc)**  
Institute of Applied Mathematics, Leibniz Universität Hannover, Hannover, Germany

06/2012–09/2013 **Finite Element Development Engineer**  
Mechanics and Simulation Development, R&D-Department, Continental Reifen Deutschland GmbH, Hannover, Germany

12/2008–05/2012 **Research Assistant (PhD)**  
Institute of Applied Mathematics, Leibniz Universität Hannover, Hannover, Germany

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## EDUCATION

12/2008–01/2012 **PhD in Mathematics (Dr. rer. nat.)**  
Institute of Applied Mathematics, Leibniz Universität Hannover, Hannover, Germany

09/2007–11/2008 **Master of Science (M.Sc.) in Mathematics**  
Brunel University West London, Uxbridge, UK

10/2004–10/2011 **Diplom-Ökonom (Dipl.-Ök.), equivalent to M.Sc. in Economics and Business Studies**  
Leibniz Universität Hannover, Hannover, Germany

10/2004–09/2007 **Bachelor of Science (B.Sc.) in Mathematics**  
Leibniz Universität Hannover, Hannover, Germany

10/2003–09/2004 Junior studies (as pupil) of mathematics and economics  
Leibniz Universität Hannover, Hannover, Germany

08/2001–07/2002 Exchange Student, Albury, New South Wales, Australia

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## RESEARCH INTERESTS

Finite and Boundary Element Methods (FEM/BEM) for partial differential equations

*hp*-adaptivity for FEM and BEM

(Hemi)-variational inequalities, e.g. obstacle problems, frictional contact problems and delamination problems

Optimal control of PDEs

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## PUBLICATIONS

### PEER-REVIEWED PUBLICATIONS:

1. L. Banz, J. Petsche and A. Schröder, *hp-FEM for a stabilized three-field formulation of the biharmonic problem*, Computers & Mathematics with Applications 77 (2019) 2463–2488
2. L. Banz, J. Petsche and A. Schröder, *Two Stabilized Three-Field Formulations for the Biharmonic Problem*, Advanced Finite Element Methods with Applications Selected Papers from the 30th Chemnitz Finite Element Symposium 2017 (accepted 2018)
3. L. Banz, J. Petsche and A. Schröder, *Explicit and implicit reconstructions of the potential in dual mixed hp-finite element methods*, Advanced Finite Element Methods with Applications Selected Papers from the 30th Chemnitz Finite Element Symposium 2017 (accepted 2018)
4. L. Banz, J. Petsche and A. Schröder, *Hybridization and stabilization for hp-finite element methods*, Applied Numerical Mathematics 136 (2019) 66–102
5. L. Banz, B. P. Lamichhane and E. P. Stephan, *Higher order FEM for the obstacle problem of the  $p$ -Laplacian - a variational inequality approach*, Computers & Mathematics with Applications 76 (2018) 1639–1660
6. L. Banz, B. P. Lamichhane and E. P. Stephan, *Higher order mixed FEM for the obstacle problem of the  $p$ -Laplacian using biorthogonal systems*, Computational Methods in Applied Mathematics (ahead of print 2018)
7. N. Ovcharova and L. Banz, *Coupling regularization and adaptive hp-boundary element method for the solution of a delamination problem*, Numerische Mathematik 137 (2017) 303–337
8. L. Banz, B. P. Lamichhane and E. P. Stephan, *A new three-field formulation of the biharmonic problem and its finite element discretization*, Numerical Methods for Partial Differential Equations 33 (2017) 199–217
9. L. Banz, H. Gimperlein, A. Issaoui and E. P. Stephan, *Stabilized mixed hp-BEM for frictional contact problems in linear elasticity*, Numerische Mathematik 135 (2017) 217–263
10. L. Banz, H. Gimperlein, Z. Nezhi and E. P. Stephan, *Time domain BEM for sound radiation of tires*, Computational Mechanics 58 (2016) 45–57
11. L. Banz and E. P. Stephan, *Comparison of Mixed hp-BEM (Stabilized and Non-Stabilized) for Frictional Contact Problems*, Journal of Computational and Applied Mathematics 295 (2016) 92–102
12. L. Banz and A. Schröder, *Biorthogonal Basis Functions in hp-Adaptive FEM for Elliptic Obstacle Problems*, Computers & Mathematics with Applications 70 (2015) 1721–1742
13. L. Banz and E. P. Stephan, *On hp-adaptive BEM for frictional contact problems in linear elasticity*, Computers & Mathematics with Applications 69 (2015) 559–581
14. L. Banz, A. Costea, H. Gimperlein and E. P. Stephan, *Numerical simulations of the nonlinear Molodensky problem*, Studia Geophysica et Geodaetica 58 (2014) 589–504

15. L. Banz and E. P. Stephan, *A Posteriori Error Estimations of hp-Adaptive IPDG-FEM for Elliptic Obstacle Problems*, Applied Numerical Mathematics 76 (2014) 76–92
16. L. Banz and E. P. Stephan, *hp-Adaptive IPDG/TDG-FEM for Parabolic Obstacle Problems*, Computers & Mathematics with Applications 67 (2014) 712–731
17. E. P. Stephan, M. Andres, L. Banz, A. Costea, L. Neemann, C. Lämmerzahl, E. Hackmann, S. Herrmann and B. Rievers *High precision modeling towards the  $10^{-20}$  level*, ZAMM - Journal of Applied Mathematics and Mechanics 93 (2013) 492–498

OTHER PUBLICATIONS:

1. L. Banz, *hp-Finite Element and Boundary Element Methods for Elliptic, Elliptic Stochastic, Parabolic and Hyperbolic Obstacle and Contact Problems*, PhD thesis, Leibniz Universität Hannover, 2012 (published online)
2. L. Banz and E. P. Stephan, *hp-TDG/IPDG for Parabolic Obstacle Problems*, Proceedings in Applied Mathematics and Mechanics 11 (2011) 763–764

PREPRINTS:

1. L. Banz, M. Hintermüller and A. Schröder, *hp-Finite Elements for Elliptic Optimal Control Problems with Control Constraints*
2. P. Bammer, L. Banz and A. Schröder, *hp-FEM in Elastoplasticity – Part 1: A Priori Error Estimates*
3. L. Banz, M. Ilyas, B. P. Lamichhane, W. McLean, E. P. Stephan, *A Mixed Finite Element Method for the Poisson Problem Using a Biorthogonal System with Raviart-Thomas Elements*
4. L. Banz, J. E. Ospino Potillo and E. P. Stephan, *Non-conforming FE/BE coupling for two-dimensional electromagnetic problems*
5. L. Banz, G. Milicic and N. Ovcharova, *Improved stabilization technique for frictional contact problems solved with hp-BEM*
6. L. Banz, J. Petsche and A. Schröder, *A posteriori error estimates for hp-dual mixed and mixed-hybrid finite elements*
7. L. Banz, G. Milicic and A. Schröder, *Solution schemes for variational inequalities with generalized box constraints*

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## LONGER RESEARCH AND TEACHING STAYS

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|---------|---|
| 08/2016 | University of Newcastle, Australia            |
| 08/2011 | Universidad del Norte, Barranquilla, Colombia |

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## AWARDS AND FINANCIAL SUPPORT

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| 2014 | <b>Conference travel support program</b> for attending a conference in Barranquilla, Colombia, German Academic Exchange Service (DAAD)          |
| 2011 | <b>Guest lecture program</b> for giving a lecture at the Universidad del Norte, Barranquilla, Colombia, German Academic Exchange Service (DAAD) |
| 2008 | <b>John Gregory Memorial Prize</b><br>Best student award, Brunel University West London, Uxbridge, UK   |

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## TEACHING

*Seminar Technische Mathematik\**, Paris Lodron Universität Salzburg, 2018  
*Methoden der Numerik und Optimierung\**, Paris Lodron Universität Salzburg, 2018<sup>◇</sup>  
*Wissenschaftliches Rechnen*, Paris Lodron Universität Salzburg, 2017<sup>◇</sup>  
*Numerik von Differentialgleichungen II*, Paris Lodron Universität Salzburg, 2017  
*Mathematische Software*, Paris Lodron Universität Salzburg, 2016–2017  
*Mathematik I–IV für Ingenieurwissenschaften*, Paris Lodron Universität Salzburg, 2014–2018<sup>◇</sup>  
*Projektpraktikum*, Paris Lodron Universität Salzburg, 2015  
*Einführung in die numerische Optimierung*, Paris Lodron Universität Salzburg, 2015<sup>◇</sup>  
*Numerische Mathematik II*, Leibniz Universität Hannover, 2011<sup>☆</sup>, 2014<sup>◇</sup>  
*Algorithmisches Programmieren*, Leibniz Universität Hannover, 2013<sup>◇</sup>  
*hp-FEM: Theory and Implementation\**, Universidad del Norte, Barranquilla, Kolumbien, 2011  
*Numerik Partieller Differentialgleichungen I+II*, Leibniz Universität Hannover, 2011<sup>☆</sup>  
*Randelementmethoden\**, Leibniz Universität Hannover, 2011<sup>☆</sup>  
*Numerische Mathematik I*, Leibniz Universität Hannover, 2010<sup>☆</sup>  
*Multigrid und Gebietszerlegung\**, Leibniz Universität Hannover, 2010<sup>☆</sup>  
*Grundlagen der Finite Elemente Methode*, Leibniz Universität Hannover, 2010<sup>☆</sup>  
*Numerik für Kontaktprobleme\**, Leibniz Universität Hannover, 2009<sup>☆</sup>  
*hp-Methoden für Finite Elemente\**, Leibniz Universität Hannover, 2009<sup>☆</sup>  
*Numerik für Integralgleichungen\**, Leibniz Universität Hannover, 2009<sup>☆</sup>  
*Theorie der Näherungsverfahren\**, Leibniz Universität Hannover, 2009<sup>☆</sup>  
*Numerik für Informatik und comp. Ingenieurwissenschaften*, Leibniz Universität Hannover, 2008<sup>☆</sup>

(\*: Master courses, <sup>◇</sup>: Lecture and Excersises, <sup>☆</sup>: Excersises)