Dipl.-Ing. Lukas Einkemmer, PhD MSc BSc

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Education

2011–2014	**PhD in applied mathematics** University of Innsbruck, University of California Merced (research stay) **graduation with excellent success**
2010–2011	**Dipl.-Ing. in applied mathematics** University of Innsbruck **graduation with excellent success**
2010–2013	**MSc in physics (theoretical quantum physics)** University of Innsbruck
2007–2010	**BSc in applied mathematics** University of Innsbruck, University of New Orleans (joint study program) **graduation with excellent success**
2007	English language training school Boston, United States of America
2001–2006	**Higher Technical Institute in electrical engineering** HTL Anichstraße, Innsbruck **graduation with excellent success**
1997–2001	Grammar school, BG/BRG Sillgasse, Innsbruck
1992–1997	Elementary school, Völs

Research projects

2015	Exponential integrators for modern many-core architecture Co-author, TWF project
2014	High-resolution numerical schemes for hyperbolic conservation laws, and their performance on modern HPC architectures Co-author, VSC school project
2014	Splitting Methods for the Vlasov-Poisson and Vlasov-Maxwell Equations One million core-hours on the VSC-2
2013	Splitting methods for the Vlasov–Poisson and Vlasov–Maxwell equations Co-author, FWF project

Prizes & Awards

2015	**SciCADE New Talent Award**
2014	**Oberwolfach Leibniz Graduate Student**
2013	**Heidelberg Laureate Forum**
2013	**Appreciation award of the federal minister for science**
2013	**Marshall Plan Scholarship**
2007–2014	**Achievement based scholarship of the University of Innsbruck**
2012	PhD scholarship of the University of Innsbruck
2012	Master theses supported by the Science fund of the Tiroler Landesregierung
2008	Joint study scholarship

Employment

Since 2014	University of Innsbruck Tenure track position
Since 2014	University of Innsbruck/Austrian Science Fund (FWF) Postdoctoral researcher
2013–2014	University of Innsbruck/Austrian Science Fund (FWF) PhD position
2009–2013	University of Innsbruck, Institute of Mathematics Teaching position
2011	Bartenbach GPGPU training
2010	University of Innsbruck Project collaboration (Java applets)
2006–2007	Austrian Red Cross Civil service
2003–2005 (Summer)	World-Direct.at eBusiness Solutions GmbH Web programming

International examinations

TOEFL		113 of 120 points
SAT	Critical Reading:	640 of 800 points
	Math:	720
	Writing:	610
SAT Subject	Math Level 1:	760 of 800 points
	Math Level 2:	760
	Physics:	780

Misc

Since 2011	Member of the association of American football officials in Austria
2011	21st Vojtech Jarnik International Mathematical Competition Ostrava
2010	17th International Mathematics Competition (honorable mention) Blagoevgrad
2009	16th International Mathematics Competition (honorable mention) Budapest

Publications

Papers

L. Einkemmer and A. Ostermann. A splitting approach for the Kadomtsev–Petviashvili equation. *J. Comput. Phys.*, 299:716–730, 2015

L. Einkemmer and A. Ostermann. Overcoming order reduction in diffusion-reaction splitting. Part 1: Dirichlet boundary conditions. *SIAM J. Sci. Comput.*, 37(3):A1577–A1592, 2015

L. Einkemmer, Z. Vörös, G. Weihs, and S. Portolan. Polarization entanglement generation in microcavity polariton devices. *Phys. Status Solidi (b). DOI: 10.1002/pssb.201451704*, 2015

L. Einkemmer and A. Ostermann. On the error propagation of semi-Lagrange and Fourier methods for advection problems. *Comput. Math. Appl.*, 69(3):170–179, 2015

N. Crouseilles, L. Einkemmer, and E. Faou. A Hamiltonian splitting for the Vlasov–Maxwell system. *J. Comput. Phys.*, 238:224–240, 2015

L. Einkemmer and M. Wiesenberger. A conservative discontinuous Galerkin scheme for the 2D incompressible Navier–Stokes equations. *Comput. Phys. Comm.*, 185(11):2865–2873, 2014

L. Einkemmer and Ostermann A. A comparison of triple jump and Suzuki fractals for obtaining high order from an almost symmetric Strang splitting scheme. *Oberwolfach Reports, No. 14/2014*, 2014

L. Einkemmer and A. Ostermann. A strategy to suppress recurrence in grid-based Vlasov solvers. *Eur. Phys. J. D*, 68:197, 2014

S. Portolan, L. Einkemmer, Z. Vörös, G. Weihs, and P. Rabl. Generation of hyper-entangled photon pairs in coupled microcavities. *New J. Phys.*, 16:063030, 2014

L. Einkemmer and A. Ostermann. An almost symmetric Strang splitting scheme for nonlinear evolution equations. *Comput. Math. Appl.*, 67(12):2144–2157, 2014

L. Einkemmer and A. Ostermann. An almost symmetric Strang splitting scheme for the construction of high order composition methods. *Comput. Appl. Math.*, 271:307–318, 2014

L. Einkemmer and A. Ostermann. Convergence analysis of a discontinuous Galerkin/Strang splitting approximation for the Vlasov–Poisson equations. *SIAM J. Numer. Anal.*, 52(2):757–778, 2014

L. Einkemmer and A. Ostermann. Convergence analysis of Strang splitting for Vlasov-type equations. *SIAM J. Numer. Anal.*, 52(1):140–155, 2014

L. Einkemmer and A. Ostermann. Exponential integrators on graphic processing units. *High Performance Computing and Simulation (HPCS), International Conference on*, 2013

Preprints	M. Prugger, L. Einkemmer, and A. Ostermann. Evaluation of the Partitioned Global Address Space (PGAS) model for an inviscid Euler solver. *arXiv:1601.03623*, 2016
	L. Einkemmer and A. Ostermann. Overcoming order reduction in diffusion-reaction splitting. Part 2: oblique boundary conditions. *arXiv:1601.02288*, 2016
	L. Einkemmer. On the geometric properties of the semi-Lagrangian discontinuous Galerkin scheme for the Vlasov-Poisson equation. *arXiv:1601.02280*, 2016
	L. Einkemmer. Evaluation of the Intel Xeon Phi and NVIDIA K80 as accelerators for two-dimensional panel codes. *arXiv:1511.02166*, 2015
	L. Einkemmer. High performance computing aspects of a dimension independent semi-Lagrangian discontinuous Galerkin code. *arXiv:1501.05508*, 2015
	L. Einkemmer. A modern resistive magnetohydrodynamics solver using C++ and the Boost library. *arXiv:1407.3189*, 2014
Book chapter	L. Einkemmer and A. Ostermann. Splitting methods for the Vlasov–Poisson and Vlasov–Maxwell equations. In M. Barden and A. Ostermann, editors, *Scientific Computing @ uibk*. Innsbruck University Press, 2014
Theses	Splitting methods for the Vlasov–Poisson and Vlasov–Maxwell equations PhD thesis (2014), Advisor: Prof. Alexander Ostermann
	Parametric scattering in microcavities Master thesis in physics (2013), Advisor: Prof. Gregor Weihs
	Exponential integrators on graphic processing units Master thesis in mathematics (2011), Advisor: Prof. Alexander Ostermann
	Monte Carlo methods Bachelor thesis (2010), Advisor: Prof. Alexander Ostermann
	Topics in non-linear differential equations Bachelor thesis (2009), Advisor: Prof. Norbert Ortner

Conferences & Workshops

Plenary talks	**International Conference on Scientific Computing and Differential Equations (SciCADE), 2015**
Talks	Numerical Solution of Differential and Differential-Algebraic Equations (NUMDIFF-14), 2015
	Multiscale numerical methods for differential equations (Rennes), 2015
	The 8th International Congress on Industrial and Applied Mathematics (ICIAM), 2015
	The 10th International ISAAC Congress, 2015
	Austrian Numerical Analysis Day, 2015
	Austrian HPC Meeting, 2015
	The 5th International Conference on Scientific Computing and Partial Differential Equations (SCPDE14), 2014
	Seminar, Ecole Normale Supérieure Cachan Bretagne (Rennes), 2014
	Numerical Analysis of Evolution Equations, 8th NAI Workshop, 2014
	International Workshop on Algorithms and Software for Scientific Computing, 2014
	European Finite Element Fair, 2014
	Austrian Numerical Analysis Day, 2014
	Oberwolfach Workshop on Nonlinear Evolution Equations: Analysis and Numerics, 2014
	International Conference on Scientific Computing and Differential Equations (SciCADE), 2013
	European Numerical Mathematics and Advanced Applications (ENUMATH), 2013
	The 2013 International Conference on High Performance Computing & Simulations (HPCS), 2013
	Encounters Between Discrete and Continuous Mathematics, 2013
	Austrian Numerical Analysis Day, 2013
	Workshop Bad Herrenalb, 2013
	Numerical Solution of Differential and Differential-Algebraic Equations (NUMDIFF-13), 2012
	Séminaire exceptionnel (Néel Institute), 2012
	7th Workshop on Innovative Integrators, 2012
Posters	Conference on Computational Physics, CCP2014
	Advances in Nonlinear PDEs: Analysis, Numerics, Stochastics, Applications, 2014
	PRACE Spring School, 2014
	Bay Area Scientific Computing Day, 2013
	The European Conference on Lasers and Electro-Optics (CLEO/Europe), 2013

Schools	Innovative concepts for complexity reduction in numerical PDEs: nonlinear approximation, sparsity, adaptivity, model reduction, Dobiacco summer school, 2015
	Matrix Theory and Computation with Applications to Network Analysis, Quantum Chemistry and Dynamical Systems, Dobiacco summer school, 2014
	PRACE Spring School (invitation only), 2014
	Geometric Integration of Ordinary and Partial Differential Equations, Dobbiaco summer school, 2013
	Christmas Colloquium on Gravitational Puzzles, 6th AFI Symposium, 2012
	MPL Autumn Academy (invitation only), Max Planck Institute for the Science of Light, 2012
	Trends in Scientific Computing, International summer school, 2012