

CV of Dr. Andreas Dedner

Dr. Andreas Dedner

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	Personal data
Family status	married, two children (born March 27th 2004, March 20th 2008)
Citizenship	Germany and USA
Day of birth	June 16th 1972
Place of birth	Bloomington, Indiana, USA
Year of doctorate	2003
Year of diploma	1998
High school graduation	1991
Languages	German, English
Computer skills	C, C++, Java, MPI, Matlab, Maple, Unix
	Education
November 2003	PhD (grade summa cum laude) supervisor: Prof. Dr. Dietmar Kröner title: <i>Solving the System of Radiation Magnetohydrodynamics for Solar Physical Simulations in 3d</i>
Since November 1998	PhD study at the department for applied mathematics at the University of Freiburg with focus on numerics and analysis in fluid dynamics
November 1998	diploma (major mathematics, minor computer science) grade: 1.0 (very good) title: <i>Eulergleichungen mit der Strahlungstransportgleichung in zwei Raumdimensionen</i> translation: <i>Euler Equations with Radiation Transfer in Two Space Dimensions</i>
October 1992	University of Freiburg
September – December 1991	University of Madison, WI, USA
June 1991	high school graduation, grade: 1.0 (very good)
September – December 1986	Junior High School, Amherst, MA, USA
1978 – 1991	Freie Waldorfschule, Marburg

Since December 2004

October 2008 - February 2009

August 2007 - October 2007

October 2006 - February 2007

October 2003, September 2004

April 1997 - November 2004

1994 – 1998

October 2005

1994

Since March 2006

Since October 2006

2005 – 2006

Since 2004

Since 1998

1994 – 1998

Planned for Spring 2009

Since July 2007

Since June 2007

Since March 2006

2005 - 2006

Positions

assistant professor at the department of applied mathematics
University of Freiburg

Professor at the University of Bochum

visiting scholar at Brown University, Providence, RI, USA

teaching position at the University of Basel, Switzerland

visiting scholar at the F.O.R.T.H. University of Heraklion,
Crete

position in a research program funded by the German resea-
rch foundation (DFG)

student assistant for teaching and academic tasks

Prizes

Ferdinand von Lindemann Preis 2004 for doctoral thesis

Landeslehrpreis Baden-Württemberg (as part of a group of
teaching assistants)

Qualifications

supervision of the project *E-DuR* funded by the ministry of
educations (one doctoral position for four years)

member of the faculty council

supervision of project *3D Simulation of Magnetohydrodynam-
ic Instabilities in Accretiondiscs* funded by the Landesstif-
tung Baden-Württemberg

referee for mathematical journals

supervision of diploma and doctoral thesis and
organization of workshops (*Time-Dependent Magnetohydro-
dynamics*, 1998, *Computational Methods for Real Gas Flow*,
2000, *Annual ANumE Conference*, 2002) and public relation
events (*Wissenschaftsmarkt* 1999, *Sim* 2001)

student representative in university committees

Grants

Dynamics on and of surfaces part of a new SPP funded by
the german research foundation (positive evaluation)

*Adaptive Modeling of Coupled Hydrological Processes with
Applications in Water Resource Management*. Funded by mi-
nistry for education (two doctoral positions for three years)

*Adaptive Numerics for Multiscale Phenomena in Meteorolo-
gical Flows*. Funded by the German research foundation (two
doctoral positions for two years)

personal grant for postdoctoral research for two years funded
by the Landesstiftung Baden-Württemberg

*Computing the in-plane transport of fluid water in air in a
diffuser* Funded by the Adam Opel GmbH

Lectures

- 2008/2009 *Discontinuous Galerkin Method for Partial Differential Equations*
(University Bochum)
Contents:
Theory and implementational aspects of the Discontinuous Galerkin for linear elliptic, parabolic, hyperbolic problems, and for non-linear advection-diffusion problems. A-priori and a-posteriori results for model problems, and the efficient implementation of the method for complex applications are discussed.
- 2006/2007 *Finite Elements for Elliptic Partial Differential Equations*
(University Basel, Switzerland)
Contents:
Finite difference and finite element methods for elliptic and parabolic problems. Implementational aspects, proof of a-priori and a-posteriori error estimates.
- 2006/2007 *Theory and Numerics for Systems of Hyperbolic Equations*
Contents:
Riemann problem for linear and non-linear systems of first order hyperbolic systems. Finite-Volume schemes in higher space dimensions.
- 2006 *Discontinuous Galerkin Methods and Scientific Computing*
(first time held at the University of Freiburg)
Contents:
Implementational aspects and theoretical results for the Discontinuous Galerkin scheme for elliptic and hyperbolic problems with mixed implicit and explicit time discretization. A special aspect was the efficient implementation using modern software design in C++.
- 2004/2005 *Numerics I and II*
(in cooperation with M. Ohlberger)
Contents first part:
Direct and iterative schemes for solving linear and non-linear equations. Polynomial, spline, and trigonometrical interpolation. Quadrature rules,
Contents second part: Schemes for initial and boundary value problems. Eigenvalue problems, approximation.

Computer courses and seminars

- 2007/2008 Computer course *Partial Differential Equations I*
- 2007 Computer course *Numerics II*
- 2006 Computer course *Partial Differential Equations II*
- 2006 Seminar *Partial Differential Equations II*
- 2005/2006 Seminar *Partial Differential Equations I*
- 2005/2006 Computer course *Partial Differential Equations I*
- 2005 Computer course *Numerics II*.
- 2002/2003 Seminar *Applied Mathematics*
- 2000 Computer course *Numerical Methods for Hyperbolic Equations*.

1999		Computer course <i>Numerics II</i> .
1998/1999		Computer course <i>Numerics I</i> .

Research interests

- Higher order schemes for evolution equations
- Locally adaptive schemes in space and time
- High performance computing
- A-priori and a-posteriori analysis of numerical schemes for evolution equations
- Mathematical modeling and numerical schemes for geophysical flows and radiation magnetohydrodynamics
- Applications in astrophysics, meteorology, and free surface flow in geophysics

Software projects

- *Dune*
Object oriented platform for grid based scientific computing
(<http://www.dune-project.org/>)
- *Dune-fem*
Object oriented platform for the solution of partial differential equations
(<http://dune.mathematik.uni-freiburg.de/>)
- *ALULib*
library for unstructured, locally adapted grids including parallelization and dynamic load balancing (<http://www.mathematik.uni-freiburg.de/IAM/Research/alugrid/>)
- *MHDSolve*
Package for solving the equations of radiation Magnetohydrodynamics in 3d
(<http://www.freidok.uni-freiburg.de/volltexte/1098/>)

Talks at conferences and workshops

Conferences

- 2008 *21st Chemnitz FEM Symposium 2008* Chemnitz, Germany September 22–24, 2008.
- 2008 *8th World Congress on Computational Mathematics*, Venice, Italy June 30–July 4, 2008.
- 2008 *12th International Conference on Hyperbolic Problems: Theory, Numerics, Applications*, College Park, USA June 9–13 2008 (invited talk).
- 2007 *6th International Council for Industrial and Applied Mathematics* Zürich, Switzerland, July 16–20, 2007.
- 2006 *Eleventh International Conference on Hyperbolic Problems: Theory, Numerics, Applications*, Lyon, France, July 17 – 21 2006.
- 2004 *International Conference on Spectral and High Order Methods*, Providence, RI, USA, June 21–25 2004.
- 2003 *International Conference on High Performance Scientific Computing*, Hanoi, Vietnam, March 10–14 2003.
- 2002 *Ninth International Conference on Hyperbolic Problems: Theory, Numerics, Applications*, Pasadena, Cal, USA, March 25–29 2002.
- 2000 *Eighth International Conference on Hyperbolic Problems: Theory, Numerics, Applications*, Magdeburg, Germany, February 28 – March 3 2000.
- 1999 *Godunov Methods: Theory and Applications*, Oxford, England, October 18–22 1999.
- 1999 *Finite Volumes for Complex Applications*, Duisburg, Germany, July 19–22 1999.

Workshops

- 2008 *V Russian-German Summer School on Parallel Programming and High Performance Computing Systems*, Novosibirsk, Russia, August 25 - September 5 2008 (two day course on DUNE).
- 2007 *ICIAM*, Zürich, Switzerland, July 16–20 2007.
- 2007 *Adaptive Numerical Methods for PDEs* Oberwolfach, Germany, June 10–16 2007.
- 2006 *SPP-MetStroem-Treffen*, Berlin, Germany, September 11–12 2006.
- 2006 *Dygram: granular dynamics, jamming, rheology and instabilities*, Rennes, France, June 19–23 2006.
- 2005 *GDR CHANT Workshop on numerical methods for kinetic, hyperbolic and Hamilton-Jacobi equations*, Strasbourg, France, November 23–25 2005.
- 2005 *1st Kazakh-German Advanced Research Workshop on Computational Science and High Performance Computing*, Almaty, Kazakhstan, September 25 – October 1, 2005.
- 2005 *International Workshop on Reliable Methods of Mathematical Modeling*, Zürich, Switzerland, July 6–8 2005.
- 2004 *Hyperbolic Conservation Laws*, Oberwolfach, Germany, April 4–10 2004.
- 2003 *Annual ANumE Conference 2003*, Magdeburg, Germany, September 2–5 2003.
- 2003 *Computational Plasma Workshop*, Heidelberg, Germany, June 30 – July 1 2003.
- 2002 *Annual ANumE Conference 2002*, Freiburg, Germany, February 4–6 2002.
- 2001 *Annual ANumE Conference 2001*, Magdeburg, Germany, January 31 – February 2 2001.
- 2000 *Hyperbolic Conservation Laws*, Oberwolfach, Germany, October 22–28 2000.
- 2000 *Computational Methods for Real Gas Flow*, Kirchzarten, Germany, April 18–20 2000.
- 1999 *Annual ANumE Conference 1999*, Magdeburg, Germany, February 3 – 5 1999.

- 1998 | *4th Hirschegg Workshop on Conservation Laws*, Hirschegg, Germany, September 21–26 1998.
- 1998 | *Time-Dependent Magnetohydrodynamics: Analytical, Numerical, and Application Aspects*, Kirchzarten, Germany, July 20–22 1998.

Invitations to Colloquiums

- 2008 | Colloquium, Münster, Germany January 08 2008.
- 2007 | Colloquium, Providence, RI, USA October 12 2007.
- 2007 | Colloquium, Madison WI, USA, October 4 2007.
- 2007 | Colloquium, München, Germany, July 5 2007.
- 2007 | Colloquium, Basel, Switzerland, February 14 2007.
- 2006 | Colloquium, Basel, Switzerland, November 10 2006.
- 2006 | Colloquium, Aachen, Germany, September 14 2006.
- 2005 | Colloquium, Bielefeld, Germany, June 23 2005.
- 2004 | Colloquium, Lausanne, Switzerland May 27 2004.
- 2003 | Colloquium, Zürich, Switzerland December 10 2003.
- 2003 | Colloquium, Iraklion, Crete, Greece, October 30 2003.
- 2003 | Colloquium, Magdeburg, Germany, May 27 2003.