CURRICULUM VITAE

MICHAEL ZAISER, DR. RER. NAT. HABIL.

CHAIR OF MATERIALS SIMULATION

DEPARTMENT OF MATERIALS SCIENCE
FAU ERLANGEN-NUREMBERG

ADDRESS

Dr. Mack-Strasse 77
90762 Fürth, Germany
Tel. +49 (0)911 6507865060
Fax +49 (0)911 6507865065
e-mail michael.zaiser@fau.de
http://www.matsim.techfak.uni-erlangen.de

PERSONAL DATA

Born 11 June 1965 in Stuttgart, Germany, married, two children.

UNIVERSITY EDUCATION

1984 – 1990	Undergraduate studies of physics at the University of Stuttgart, Germany.
1990 – 1993	Ph.D in theoretical physics at the Max-Planck Institut für Metallforschung (MPI-MF), Stuttgart, Germany. Supervisor: Prof. W. Frank. Title of thesis: 'Dislocation dynamics based models of plastic deformation instabilities'

DEGREES AWARDED

3/1990	Degree 'Diplom-Physiker', University of Stuttgart, awarded with distinction (summa cum laude).
1/1994	Doctoral degree (Dr. rer. nat.), University of Stuttgart, Germany (summa cum laude, the thesis received the University's annual award for outstanding scientific merit).
4/2002	Habilitation (theoretical physics), University of Stuttgart, Germany

---

CAREER SINCE GRADUATION

1990 – 1993	Doctoral training grant by the Max-Planck Society
1994	Research associate at MPI-MF (Group of Prof. A. Seeger)
1995 – 1996	DFG Fellowship (Auslandsstipendium) held at the Institute for Advanced Materials, Joint Research Centre of the European Commission, Ispra, Italy.
1997	Research associate at the Mechanics of Materials Laboratory, University of Thessaloniki, Greece (Group of Prof. E.C. Aifantis).
1998 – 2001	DFG Advanced Fellowship (Habilitationsstipendium) held at MPI-MF.
2001 – 2005	Lecturer, School of Engineering and Electronics, The University of Edinburgh.

2005 – 2007	Reader, School of Engineering and Electronics, The University of Edinburgh.
2008 – 2012	Professor, Chair of Mechanics of Materials, School of Engineering, The University of Edinburgh.
Since 2012	Professor, Chair of Materials Simulation, Department of Materials Science, FAU Erlangen-Nürnberg.

VISITING POSITIONS

5/6 1998	Visiting scientist at the Mechanics of Materials Laboratory, University of Thessaloniki.
10-12/2000	Visiting scientist at the Cavendish Laboratory (Microstructure Physics Group), University of Cambridge, UK
2/3 2001	Visiting scientist at Michigan Technological University, Dept. of Mechanical Engineering/Engineering Mechanics, Houghton (MI), USA
6-12/2005	Visiting professor, Institute of Complex Systems, University of Rome 'La Sapienza', Rome, Italy

---

HONORARY APPOINTMENTS

2006-2012	Adjunct Professor of Physics, Michigan Technological University, Houghton (MI), USA
Since 2014	Visiting Professor, Department of Aerospace Engineering, Imperial College London, UK

RESEARCH SUPERVISION:

Research students, first supervisor:

- Mingjun Yang, Molecular mechanics of CNT-polymer nanocomposites (PhD awarded 2005).
- Paolo Moretti, Collective behaviour in dislocation systems (PhD awarded 2006)
- Blair Fyffe, Mechanisms of snow slab avalanche release (PhD awarded 2006).
- Nikolaos Nikitas, Dislocation-based continuum models of constrained plastic flow (PhD awarded 2008)
- Jan Schwerdtfeger, Multiscale characterization of plastic flow pattterns in single crystals (PhD awarded 2008)
- Stefan Sandfeld, FEM modelling of continuously distributed dislocation systems (PhD awarded 2010)
- Olga Kapetanou, Statistical modelling of crystal microplasticity (PhD awarded 2016)
- Mehran Monavari, Continuum dislocation kinematics and dynamics (PhD awarded 2017)
- Ronghai Wu, Phase field models of deformation processes in materials with heterogeneous microstructures (PhD awarded 2017)
- Stefan Liebenstein, Generalized continuum models of deformation of cellular structures (PhD awarded 2018)
- David Fernandez Castellanos, Creep, plasticity and failure of amorphous solids, since 2013
- Samaneh Nasiri, Molecular modelling of carbon nanoparticle reinforced composites, since 2014
- Ali Safari, Transport properties of hierarchical network structures, since 2016
- Sayyed Hosseini, Strength of disordered materials: beam network and finite element models, since 2017
- Jianghui Zhai, Dislocation motion in high-entropy alloys, since 2017
- Samaneh Esfandiary, Hierarchical networks as models for biomaterials and biosystems, since 2018
- Noisabeh Esfandiary, Statistical mechanics of failure in hierarchically structured fibrous materials, since 2018

Research students, co-supervisor:

- Markos Avlonitis, Probabilistic internal-variable models for microstructure evolution in plastic deformation, University of Thessaloniki (PhD awarded 2004, first supervisor Prof. E.C Aifantis).
- QianQian Li, Synthesis and Mechanical properties of Carbon Nanotube-Polymer Nanocomposites, University of Edinburgh (PhD awarded 2006, first supervisor Dr. V. Koutsos).
- Apostolos Evangelopoulos, Polymer nanodroplets on surfaces (MSc by research 2006/07 and PhD 2007-2011, first supervisor Dr. V. Koutsos)
- Tom Barraclough, Mechanics of Snow and Avalanches (PhD awarded 2015, first supervisor Dr. Jane Blackford)

External examiner of PhD theses:

- Katerina Aifantis: Member of the examining committee, Rijksuniversiteit Groningen, The Netherlands, April 18, 2005.
- Thomas Hochrainer: External Referee and Member of the examining committee, Technical University of Karlsruhe, Germany, November 22, 2006.
- Lasse Laurson: Examination Opponent, Technical University of Helsinki, Finland, Sept. 30, 2008.
- Jari Rosti: Pre-Examiner, Aalto University, Finland, October 2010.

EXTERNAL FUNDING

Grants held in Germany before 2001

- DFG Fellowship (Postdoctoral fellowship abroad, held at JRC Ispra, Italy), 1996-1997, awarded by German Research Council DFG.
- DFG Advanced Fellowship (Habilitationsstipendium, held at Max-Planck Institut für Metallforschung, Stuttgart), 1998-2001, awarded by German Research Council DFG.
- Grant for the Organization of an International Symposium on Statistical Mechanics of Plastic Deformation, 2001, awarded by the Volkswagen Foundation.

Grants held at Edinburgh

- Grant for Materials Teaching Infrastructure, 'Engineering Materials Teaching Studio', 2003: Co-applicant, led by Prof. Christopher Hall (SEE). £80,000, funded by the SHEFC Teaching Infrastructure fund.
- EPSRC Grant 'Constitutive Equations for Crystal Plasticity from the Dynamics of Discrete Dislocation Systems', 2003-2005: Principal Investigator; £126,000, awarded by EPSRC.
- RTN Network on Size-Dependent Engineering Materials (SizeDepEn), 2004-2007; Principal Investigator at Edinburgh, Project: 'Size-dependent Mechanical Properties of Micro-and Nanostructured Materials: Dislocation-Based Models', £214,000 (at Edinburgh, total Network volume £ 1,040,000), awarded by the European Commission under the 6th framework programme.
- International Joint Project Grant IJP ,Fluctuations and Avalanches in Deformation: From Crystals to Granular Media', 2006-2008: Principal Investigator; £11980, awarded by the Royal Society.
- EPSRC Grant 'Spatial analysis of plasticity patterns in micron-sized samples', 2007-2008: Principal Investigator; £101,775, awarded by EPSRC
- Grant for Materials Teaching 'Failure analysis', 2008: Co-applicant, led by Dr. J. Blackford (SEE). £21000, funded by UK Centre for Materials Education.
- Specific targeted research project 'Triggering Instabilities in Materials and Geosystems', 2007-2010; Principal Investigator at Edinburgh, £174,018 (at Edinburgh, total volume £1,097,000), awarded by the European Commission under the 6th framework programme.
- EPSRC Grant "Localizing Signatures of Catastrophic Failure" 2011-2012: Joint project with Prof. I. Main (Edinburgh School of Geosciences), £241340, awarded by EPSRC within the ERA-Net Complexity Programme.

Grants held at FAU Erlangen-Nürnberg

- DFG-FOR 1650 “Dislocation-Based Plasticity”, 2012-2015: Project 6 “Statistical Analysis and Stochastic Modelling of Crystal Microplasticity. £212960, Principal Investigator, awarded by EPSRC after joint evaluation with DFG.
- DFG grant “Fatigue Simulation near Surfaces (FASS)”, 2014-2017, €315000, Total project volume €1.3m, Co-Investigator, awarded by DFG within the ERA-Net Materials-Net Initiative
- DFG-FOR 1650 “Dislocation-Based Plasticity”, 2015-2018: Project “Deterministic and Stochastic Continuum Models of Dislocation Pattening. €259150, Principal Investigator, awarded by DFG.
- DFG grant “Theory and Simulation of Dislocation Motion in Single-Phase High-Entropy Alloys, since 2016, €257950, Principal Investigator, awarded by DFG.
- DFG grant “Fiber bundle and Fiber network Models for Failure of Materials with Hierarchical Microstructures”, since 2017, €170800, Principal Investigator, awarded by DFG.
- DFG grant “Molecular Simulations for Developing Metal-Carbon Nanoparticle Composites”, since 2018, €288250, Principal Investigator, awarded by DFG.
- DFG Graduate School “Fracture Across Scales: Integrating Mechanics, Materials Science, Mathematics, Chemistry and Physics”, 2018-2027, Total project volume €4,800,000, Co-Investigator, awarded by DFG.

MANAGEMENT POSITIONS

- Deputy Head, Institute of Materials and Processes, School of Engineering at the University of Edinburgh, 2008-09.
- Head, Institute of Materials and Processes, the University of Edinburgh, 2009-2011.
- Member of the School Management Committee, School of Engineering, the University of Edinburgh, 2009-2011.
- Head, Institute for Materials Simulation WW8, Department of Materials Science, University of Erlangen, since 2012
- Member of the Board of Directors, Department of Materials Science, University of Erlangen, since 2012
- Deputy Head, Department of Materials Science, University of Erlangen, since 2017

ADDITIONAL INFORMATION

Publications
2 Volumes Edited, 5 Book Chapters, 114 Articles in Peer-Reviewed Journals of which 2 in Science, 1 in Nature Physics, 1 in Nature Communications. 6 in Physical Review Letters.

Citation statistics
4576 citations, h=31 (Google Scholar Citations); 3250 citations, h=29 (Scopus); 3164 citations, h=29 (ISI)

Invited lectures at international conferences:
Since 2000: 4 Plenary and keynote lectures and 42 invited lectures at international conferences, symposia and workshops, among which 7 conferences of the Multiscale Materials Modelling series (2002-2016), International Conference ‘From Nanoparticles and Nanomaterials to Nanodevices and Nanosystems’ (IC4N) 2008, Plasticity 2003 and 2006, 4th and 5th European Solid Mechanics Conferences 2000 und 2003.

Guest lecture series at international universities and summer schools
3 Lecture series at international summer schools in Germany, Greece and Turkey, lecture series as visiting professor at Michigan Technological University and the University of Thessaloniki.

Distinctions and awards
1990 Undergraduate degree awarded ‚With Distinction’ (summa cum laude).

1994 Doctoral degree awarded ‚With Distinction' (summa cum laude).
1994 Award for outstanding scientific merits by the University of Stuttgart.

Conference Organization

- Symposium Organizer, *Symposium Y: Influences of Interface and Dislocation Behavior on Microstructure Evolution*, MRS Fall 2000 Meeting, Boston (MA), USA, 27.-30. November 2000.
- Director, *Research Workshop: Statistical Mechanics of Plastic Deformation*, International Centre for Theoretical Physics, Triest, Italien, 4.-7. März 2002.
- Symposium Organizer, *Mini-Symposium: Dislocation and Disclination Models of Deformation and Failure*, 5th European Solid Mechanics Conference, Thessaloniki, Griechenland, 1.-22. August 2003.
- Member of the Scientific Committee, *XIX Sitges Conference on Jamming, Yielding and Irreversible Deformation in Condensed Matter*, Sitges (Barcelona), Spain, June 14-18, 2004
- Member of the Organizing Committee and Symposium Organizer, *Symposium 2: Statistical Mechanics of Plasticity*, 2nd International Conference on Multiscale Modelling (MMM2), Los Angeles, October 11-15, 2004
- Chairman, *International Conference on Statistical Mechanics of Plasticity and Related Instabilities*, Bangalore, Indien, 29. August – 2. September 2005.
- Member of the International Organizing Committee, *12th International Symposium on Plasticity*, Halifax, Canada, July 17-22, 2006
- Member of the Organizing Committee and Symposium Organizer, *Symposium 3: Statistical Approaches to Irreversible Deformation and Failure of Materials*, 3rd International Conference on Multiscale Modelling (MMM3), Freiburg, Germany, September 18-22, 2006
- Member of the Scientific Committee, *17th International Workshop on Computational Mechanics of Materials (ICMM17)*, Ecole des Mines de Paris, Paris, France, August 22-24, 2007
- Member of the International Advisory Board, *1st International Conference from Nanoparticles and Nanomaterials to Nanodevices and Nanosystems (IC4N1)*, Halkidiki, Greece, June 16-18, 2008
- Member of the International Advisory Committee, *4th International Conference on Multiscale Materials Modeling*, Florida State University, Tallahassee (FL), USA, October 27-31, 2008.
- Member of the Scientific Committee, *19th International Workshop on Computational Mechanics of Materials (ICMM19)*, Ovicius University of Constanta, Constanta, Romania, September 1-4, 2009.
- Symposium Organizer, *Modelling Complex Microstructures: Materials Behavior below the Scale of the Representative Volume Element*, International Conference of Numerical Analysis and Applied Mathematics 2009, Rhetymnon, Kreta, 18-22 September 2009.
- Member of the Organizing Committee and Symposium Organizer, *Statistical approaches to the mechanics of heterogeneous materials*, 5th International Conference on Multiscale Materials Modelling (MMM5), Freiburg, Germany, 4-8. October 2010.
- Symposium Organizer, *Discrete and Continuum Models of Dislocation Systems*, International Conference of Numerical Analysis and Applied Mathematics 2011, Chalkidiki, Greece, 19-24 September 2011.
- Symposium Organizer, *Symposium G: Multiscale Modeling of Crystal Plasticity: From Discrete Models to Generalized Continua*, 6th International Conference on Multiscale Materials Modelling (MMM6), Singapore, 15-19. October 2012.
- Member of the International Advisory Board, *4th International Conference from Nanoparticles and Nanomaterials to Nanodevices and Nanosystems (IC4N4)*, Corfu, Greece, June 14-18, 2013.
- Symposium Organizer, *Symposium G:Microstructure Complexity and Self-Organization in Materials*,7 th International Conference on Multiscale Materials Modelling (MMM7), Berkeley, 6-10. October 2014.
- Symposium Organizer, *Symposium G:Microstructure Complexity and Self-Organization in Materials*,7 th International Conference on Multiscale Materials Modelling (MMM7), Berkeley, 6-10. October 2014.
- Organizer, CECAM *workshop "Challenges in crystal plasticity: from discrete dislocation to*

continuum models", Lugano, Switzerland (February 27 - March 1, 2017)

- Symposium Organizer, *Symposium A:Advances in Materials Theory for Multiscale Modeling*,9th International Conference on Multiscale Materials Modelling (MMM9), Osaka, 29 October – 2 November 2014

Editorships and Editorial Board Memberships

- Editorial Board, Journal of Statistical Mechanics – Theory and Experiment (Institute of Physics Publishing, from 2004)
- Associate Editor, Materials Theory (Springer Nature, from, 2017)
- Associate Editor, Journal of the Mechanical Behavior of Materials (De Gruyter, from 2012).
- Guest Editor, The Philosophical Magazine (Taylor and Francis, Vol. 87, Issues 8+9, 2007)

Participation in advisory, review, or funding bodies

- Reviewer for the European Research Council
- Reviewer for the German Research Agency DFG
- Reviewer for the US National Science Foundation
- Reviewer for the US Department of Energy
- Reviewer for the New Zealand Foundation for Research, Science & Technology
- Reviewer for the Swiss National Science Foundation
- Reviewer for the International Centre for Theoretical Physics
- Reviewer for the Italian Ministero dell'Istruzione, dell'Università e della Ricerca (MUIR)
- Member of the Evaluation Board 'Modelling and simulation of complex systems', Volkswagen Foundation.
- Member of the Evaluation Board, Interdisciplinary Centre for Advanced Materials Simulation ICAMS, University of Bochum.
- Member of the Evaluation Board, Foundation Professorships Programme, Carl Zeiss Foundation.
- Panel Member, Evaluation Panel for Proposals on Research Focus Areas in Engineering, German Research Agency DFG
