

ACADEMIC EDUCATION:**Docent in Engineering Science**

Jun. 01, 2021

Uppsala Universitet (Uppsala University) in Sweden
Faculty of Science and Technology
Proficiency in Teaching in Applied Mechanics

Habilitation

Jul. 10, 2019

Technische Universität Berlin (Technical University of Berlin) in Germany
Faculty V of Mechanical Engineering and Transport Systems
Proficiency in Teaching in Mechanics

Habilitation thesis (in German and English):

„Thermodynamics of deformable solids under electromagnetic interaction and computation of multiphysics applications”

Doctoral Degree in Engineering (Dr.-Eng.)

Feb. 02, 2009 – Feb. 14, 2014

Technische Universität Berlin (Technical University of Berlin) in Germany
Faculty V of Mechanical Engineering and Transport Systems
Institute of Mechanics, Chair of Continuum Mechanics and Materials Theory
<http://www.lkm.tu-berlin.de/>

Doctoral thesis (in English):

“Thermodynamically compatible modeling, determination of material parameters, and numerical analysis of nonlinear rheological materials”

Christina Völlmecke (chair), Wolfgang H. Müller (advisor), Maria Kashtalyan (examiner)

Master of Science in Mechanical Engineering (M.Sc.)

Oct. 16, 2006 – Aug. 04, 2008

Technische Universität München (Technical University of Munich) in Germany
Department of Mechanical Engineering, Chair of Computational Mechanics
<http://www.lnm.mw.tum.de/>

M.Sc. thesis (in English):

“Space adaptivity using a posteriori residual based error estimation in the finite element method for the incompressible Navier–Stokes equations”

Wolfgang A. Wall (chair), Volker Gravemeier (advisor)

Midterm thesis (in German):

“Non Uniform Rational B-Spline (NURBS) implementation for finite element method”

Bachelor of Science in Mechanical Engineering (B.Sc.) Sep. 15, 2001 – Feb. 08, 2006

Istanbul Teknik Üniversitesi (Istanbul Technical University) in Turkey
Department of Mechanical Engineering, Institute of Strength of Materials
<http://www.mkn.itu.edu.tr/>

B.Sc. thesis (in Turkish):
“Plastic injection mold design and its computational analysis”

Secondary School

Jul. 16, 1993 – Jun. 15, 2001

Austrian St. Georg’s College, Istanbul, Turkey

PROFESSIONAL EXPERIENCE:

Oct. 2024 Visiting Professor in Sorbonne Paris Nord University, France

Oct. 2023 Visiting Professor in Graz University, Austria

Oct. 2022 Visiting Professor in Sorbonne Paris Nord University, France

from Nov. 2020

Associate Professor in Solid Mechanics
Division of Applied Mechanics
Department of Materials Science and Engineering
Uppsala University, Sweden

- Instructor in engineering courses
- Supervisor for Bachelor, Master, and Doctoral thesis
- Reviewing scientific works
- Applying for grants

Sep. 2019 – Sep. 2020

Affiliated researcher at the Magnel Laboratory for Concrete Research
Department of Structural Engineering and Building Materials
Ghent University, Belgium

External collaborator in the Institute of Structural Engineering
University of Natural Resources and Life Sciences, Vienna, Austria

- Supervisor for Bachelor, Master, and Doctoral thesis
- Reviewing scientific works
- Scientific collaboration with Prof. R. Wan-Wender, Magnel Laboratory Ghent University, Christian Doppler Laboratory, BOKU Vienna and Prof. J. Vorel at the Czech Technical University in Prague, Department of Mechanics. Project: Mechanochemistry during the curing process in epoxy based polymers.

Jan. 2019 – Jun. 2019

Scientific Collaboration with Fraunhofer IZM, Institute of Reliability and Microelectronics

- Supervisor for Bachelor and Master thesis
- Applying for grants
- Project: Thermomechanical fatigue in electronic components and their connections.

Aug. 2017 – Sep. 2019

Postdoctoral Associate in the Institute of Mechanics
Technische Universität Berlin in Germany

- Instructor in engineering courses
- Supervisor for Bachelor and Master thesis
- Reviewing scientific works
- Applying for grants
- Scientific collaboration with Prof. Dr. A. Freidin from the St. Petersburg Polytechnical University, Russia. Project (partly funded by the Daimler and Benz Foundation, Ladenburg): Mechanochemistry in intercalation of Li-ions in batteries.

Aug. 2016 – Jul. 2017

Postdoctoral Fellow in the Department of Mechanical Engineering
University of California, Berkeley in USA (UCB)

- Reviewing scientific works
- Scientific collaboration with Prof. Dr. P. Papadopoulos at the UCB for the project (funded by the Max Kade Foundation, New York): Continuum-on-continuum homogenization for describing generalized mechanics
- Scientific collaboration with Prof. Dr. T. I. Zohdi at the UCB, Computational Manufacturing and Materials Research Laboratory. Project: Simulation of electric damage mechanics in soft manner.
- Scientific collaboration with Prof. Dr. O. Savas at the UCB, Fluid Mechanics Laboratory. Project: Experimental and computational analysis of viscous fluid flow.

May 2014 – Jul. 2016

Postdoctoral Associate in the Institute of Mechanics
Technische Universität Berlin in Germany

- Instructor in engineering courses
- Supervisor for Bachelor and Master thesis
- Reviewing scientific works
- Applying for grants

- Scientific collaboration with Prof. Dr. F. dell'Isola from the Sapienza Università di Roma, Italy. Project: Characterization of metamaterials with inner substructure.
- Scientific collaboration with Prof. Dr. V. Eremeyev from the Gdansk University of Technology, Poland. Project: Numerical analysis in generalized continuum.

Feb. 2009 – Feb. 2014

Research and Teaching Assistant in the Institute of Mechanics
Technische Universität Berlin in Germany

- Teaching assistant and associate in engineering courses
- Supervisor for Bachelor and Master thesis
- Scientific collaboration with Prof. Dr. W. H. Müller from the Technical University of Berlin, Germany. Project: Characterization of nonlinear rheological materials by using thermodynamics and experiments.
- Scientific collaboration with Prof. Dr. M. Kashtalyan from the University of Aberdeen, Scotland, UK. Project: Analytical solution methods for verifying computation of heterogeneous materials.
- Scientific collaboration with Prof. Dr. I. Müller from the Technical University of Berlin, Germany. Project: Thermodynamically sound derivation of constitutive equations.
- Scientific collaboration with Prof. Dr. D. Georgievskii from the Lomonosov Moscow State University, Russia. Project: Stability analysis for nonlinear materials and their corresponding constitutive equations.

Nov. 2006 – May 2008

CAE Engineer in Team Chassis, TUfast Racing Team e.V. Garching in Germany

- Simulation of composite materials (chassis, nose, wheels) in extreme loading conditions
- Topology optimization by using the finite element method
- Writing the design report

Formula Student Germany 2007, Engineering Design Award
Formula Student USA (Michigan) 2008, Overall 3rd Place

Mar. 2006 – Jun. 2006

CAE Engineer, Magna Powertrain Engineering Center Steyr GesmbH & CoKG in Austria

- Simulation of several critical car components for Volkswagen AG, Audi AG, Porsche AG
- Fatigue related damage estimation of critical parts
- Topology optimization by using the finite element method

Jul. 2005 – Sep. 2005

Internship in Robert Bosch GmbH in Turkey

Project: Optimization of milling operations for the common rail injector (CRI) body manufactured by Bosch

CERTIFICATES in TEACHING:**Berlin Certificate of Teaching Internationally**

Sep., 2015 – Jan., 2019

Berliner Zentrum für Hochschullehre (Berlin Center of Higher Education) in Germany
Program for intercultural teaching in English, 148 work units**Berlin Higher Education Teaching Certificate**

Jul., 2009 – Jul., 2016

Berliner Zentrum für Hochschullehre (Berlin Center of Higher Education) in Germany
Program for design and implementation of a new course in German, 204 work units**Professional Certificate in Teaching in Higher Education**

Jul., 2009 – Jul., 2013

Technische Universität Berlin, Germany

Center for Scientific Continuing Education and Cooperation (ZEWK)

Continuing Education Program for Promotion of Quality in Teaching, 223 work units

CERTIFICATES in MANAGEMENT:**Project Management in a Nutshell**

Mai 27-28, 2020

University of Natural Resources and Life Sciences, Vienna
Personal Development Department**Agile Project Management**

Mai 28-29, 2018

Technische Universität Berlin, Germany

Human Resources & Continuing Education

TEACHING EXPERIENCE:**Instructor**

Manufacturing Methodologies in English, theory of machining, forging, welding, stamping, additive manufacturing, casting, molding, rapid prototyping, lean systems in general, hands-on labs in CAD/CAM (specifically, welding and CNC 3 axes mill and CNC lathe), practical elements in precision measurement. In the Division of Applied Mechanics at Uppsala University (UU) in Uppsala / Sweden, for 2 term.

Structural Optimization I in English, theory and computation for optimization problems in engineering science for graduates: differences in parametric, shape, and topology optimization, analytic and graphical solution methods for truss systems, inverse problem and linear regression, linear elasticity problem, construction of weak form in linear elasticity, finite element analysis in linear elasticity, method of solution in topology optimization, solid isotropic material with penalization (SIMP), introduction to and hands-on coding in Python and by using open-source packages. In the Division of Applied Mechanics at Uppsala University (UU) in Uppsala / Sweden, for 4 terms.

Structural Optimization II in English, theory and computation for advanced optimization problems in engineering science for graduates: incremental solution in nonlinear problems, adjoint method in optimization, structural optimization in nonlinear elasticity problem, heat conduction problem, viscous fluid flow problem, hands-on coding in Python and by using open-source packages. In the Division of Applied Mechanics at UU in Uppsala, for 3 terms.

Continuum mechanics in English, separating axioms and models, balance equations, constitutive (material) equations in fluid and solid dynamics for linear and nonlinear material models, analytical solutions in linear partial differential equations such as channel flow in fluid and propagating waves in solids. In the Division of Applied Mechanics at UU in Uppsala, for 2 term.

Computational Reality in German, theory and computation of continuum mechanics for graduates: nonlinear elasticity in solids, nonlinear fluid dynamics, fluid-structure interaction, thermomechanics, coupled electromagnetism with thermomechanics. Solution of problems with the finite element method by using open-source packages. In the chair of Continuum Mechanics and Materials Theory (LKM) at the Technische Universität Berlin (TUB) in Berlin / Germany, for 7 terms.

Mechanics of Materials in German, mechanics for freshmen: linear algebra, statics and rigid body mechanics, equilibrium conditions, Hooke's law, basic kinematics, kinetics of rigid body. Engineering systems like Euler-Bernoulli beam theory as well as analytical solutions in tensile and bending, weekly exercises in smaller groups, in LKM at TUB in Berlin, for 1 term.

Theory and Computation of Composite Materials in English, applied continuum mechanics for graduates: linear elasticity, crystal classes and anisotropy, Voigt's notation, classical laminate theory, nonlinear elasticity, hyperelasticity. Analysis, implementation, and computation of problems especially for light structures such as composite as well as additively manufactured materials. In the TU Berlin Summer School (TUBS) in Berlin / Germany, for 1 term.

Computational Engineering in English, applied continuum mechanics for graduates: linear elasticity, nonlinear elasticity, electromagnetism in rigid bodies, polarization, electromagnetism in deformable solids, piezoelectricity. Implementation and solution of problems by using the finite element method with the aid of open-source packages. In the TUBS in Berlin, for 1 term.

Mechanics of Composite Materials in German, theory of composite materials for undergraduates: theory of materials, classical theory of laminates, analytical solution of simple problems. In the Stability and Failure of Functionally Optimized Structures Group at TUB in Berlin, for 2 terms.

Numerical Methods for Engineers in German, theory of numerical methods for undergraduates: solution of functions as well as linear systems, quadrature, solution of differential equations, finite element method. In the Department of Engineering at the Turkish German University (TAU) in Istanbul / Turkey, for 2 terms.

Finite Elements Method in German, theory of finite elements method for undergraduates, variational formulation in thermoelasticity, preprocessing, solvers, postprocessing, at TAU in Istanbul, for 3 terms.

Statics in German, mechanics for freshmen: linear algebra, statics, forces, rigid body diagrams, equilibrium conditions, truss structures, at TAU in Istanbul, for 1 term.

Lecturer

Hands on Project to Finite Element Method in English, theory of deformable solids under thermal loading and computation of fatigue related damage in electronics: linear elasticity, thermal expansion, plasticity, creep, fatigue estimation. Implementation and solution of problems by using the finite element method in Abaqus. In LKM at TUB in Berlin, for 1 term.

Simulationtools and its Applications in German, projects with smaller groups (undergraduates) such as experiments and inverse analysis, in LKM at TUB in Berlin, for 7 terms.

Statics in German, mechanics for all freshmen, at TAU in Istanbul, for 1 term.

Mechanics of Materials in German, mechanics for undergraduates, at TAU in Istanbul, for 1 term.

Teaching Associate

Statics and Mechanics of Materials in German, mechanics for all freshmen, in LKM at TUB in Berlin, for 2 terms.

Kinematics and Dynamics in German, mechanics for undergraduates, in LKM at TUB in Berlin, for 2 terms.

Continuum Mechanics in German, introduction to continuum mechanics for undergraduates, in LKM at TUB in Berlin, for 2 terms.

Energy Methods in German, classical mechanics for undergraduates, in LKM at TUB in Berlin, for 2 terms.

Teaching Assistant

Finite Elements Method in German, theory of finite elements method with an application from microelectronics as the term project in smaller groups (undergraduates), in LKM at TUB in Berlin, for 12 terms.

Tensor Calculus in German, theory of tensor calculus for continuum mechanics for graduates, in LKM at TUB in Berlin, for 1 term.

Continuum Physics in German, advanced continuum mechanics with analytical solutions of physical systems for graduates, in LKM at TUB in Berlin, for 1 term.

Mechanics of Materials in German, mechanics for freshmen in some degree programs, in LKM at TUB in Berlin, for 1 term.

LANGUAGES and HOBBIES:

Turkish (native speaker)
German (lecturing in German)
English (lecturing in English)

Ashtanga Yoga (since 2006)
Playing Jazz Guitar (more than 50 gigs on small stages in 2005–2015)

AWARDS:

1st place, Arts and Science contest of the WCCM-ECCOMAS 2020, with the work “Everyday Battle Within Batteries”

3rd place, Digital & Tech contest in Research to Market Challenge 2020, Berlin, with the proposal “Actively Cooled Metal Printing, ACMP”

GRANTS:

Cooperation in the project “VHT-STORAGE: Very High-Temperature Borehole Thermal Energy Storage” sponsored by Eureka Network AISBL, Eurostars 3 - Call 9, Sweden-Denmark joint project, size: EUR 1 295 152 for 36 months (2026-2029)

Cooperation in the project “The battery initiative Compel (COMPetitiveness for the ELectrification of the transport system)” The initiative is a government assignment to Uppsala University, Chalmers University of Technology, and Lund University since 2022.

Lead of the project “Multiphysics simulations: dielectric composite manufacturing” sponsored by the Swedish Foundation for Strategic Research (Stiftelsen för Strategisk Forskning, SSF IPD023-0021) and Hitachi Energy AB (Ludvika, Sweden), project size: SEK 2 068 000 for 24 months (2024-2025)

Cooperation in the project “Multiphysics fracture modeling of batteries across length scales aiming for increasing lifetime and charging capacity” sponsored by the Swedish Energy Agency (Energimyndigheten - P2023-00073), project size: SEK 5 965 000 for 60 months (2023-2027)

Lead of the project “Recycling 3-D printed parts” sponsored by the Uppsala University Climate Pot for device acquisition, project size: SEK 30 000 in 2021 and 2023

Lead of the project “Additively manufactured multiscale materials” sponsored by the Uppsala University Strategic Call for external collaborations, project size: SEK 408 200 between (2021-2024)

Cooperation in the project “Simulation of shear tests of bonding with novel thick-Aluminum

filaments in order to assess the bond quality” sponsored by the German Research Foundation (DFG - 456843234), project size: € 201 360 for 24 months (2021-2023)

Cooperation in the project “Additively manufactured endless PLA-fibers reinforced PLA composite materials for small and medium enterprises in industrial farming (PLA² fArMing)” sponsored by TU Berlin Strategic Call 2020 “per sustainability” project size: € 148 600 for 24 months (2020-2022)

Lead of the project “Multiphysics Computation of Li-Ion Batteries” sponsored by the Daimler and Benz Foundation, Postdoctoral Scholarships 2018, project size: € 40 000 for 24 months (2018-2020)

Travel fund for a visiting scholar from Russia to Berlin, International Affairs at the TU Berlin, award amount: € 1 200 in November 2018

Travel fund as an invited speaker to Italy, GNFM Italy (National Group of Mathematical Physics), award amount: € 500 in September 2018

Cooperation in the project “Mechanochemistry of Advanced Anode Designs in Li-Ion Batteries” sponsored by the German Research Foundation (DFG - MU 1752/47), project size: € 215 625 for 36 months (2018-2021)

Grantee of the Max Kade Foundation Fellowship Program, selected by the German Research Foundation (DFG), award amount: \$64 000 for 12 months (2016-2017)

Travel fund as an invited speaker to Russia, International Affairs at the TU Berlin, award amount: € 500 in October 2014

Cooperation in the joint project “Indentation of anisotropic materials with gradients in elastic properties” with CEMINACS, School of Engineering, University of Aberdeen, sponsored by the Royal Society, project size: £12 000 for 24 months (2010-2012)

AFFILIATIONS:

ISIMM, The International Society for the Interaction of Mechanics and Mathematics

IACM, International Association for Computational Mechanics

GACM, German Association for Computational Mechanics

MEMOCS, Mathematics and Mechanics of Complex Systems

DHV, Deutscher Hochschulverband (German Association of Uni. Professors and Lecturers)

TUfast Student Racing Team e. V.

ITU Science Center, Istanbul

BTBTM, Turks Center of Science and Technology

Fellow of the Genshagener Kreis e. V.

ENTREPRENEURIAL:

Co-founder and board member of animi motus e. V. in Berlin
 Co-founder of Popper Pay AB in Gothenburg
 Co-founder and chairman of Cybersolid AB in Stockholm
 Co-founder and chairman of Kunstlink AB in Stockholm

ORGANISATION OF SCIENTIFIC MEETINGS:

- | | |
|------------------------------|---|
| Jun. 11-14, 2024 | <i>MS-10 Novel computational methods with applications in continuum mechanics</i> , ICoNSoM 2024, International Conference on Nonlinear Solid Mechanics, Cagliari, Italy. |
| Sep. 25-29, 2023 | <i>MS02 - Computational methods for modeling complex media</i> , MEM-OCS invitation only conference, Modeling Complexity in Mechanics, Alghero, Italy. |
| Jul. 31-Aug. 05, 2022 | <i>MS0308 - Computations in mechanics of metamaterials</i> , WCCM 2022, 15th World Congress on Computational Mechanics and 8th Asian Pacific Congress on Computational Mechanics, Yokohama, Japan (online). |
| Jun. 13-17, 2022 | <i>MS-7 Novel computational methods with applications in continuum mechanics</i> , ICoNSoM 2022, International Conference on Nonlinear Solid Mechanics, Alghero, Italy. |
| Jan. 11-14, 2021 | <i>MS273 - Modeling and computation of batteries</i> , WCCM 2020, 14th World Congress in Computational Mechanics and ECCOMAS Congress, Paris, France (online). |
| Jun. 25, 2020 | Workshop in Recent Challenges and Solutions in Metamaterials, Arpino, Italy (online). |
| Aug. 28-30, 2019 | <i>MS01: Application and Computational Methods in Metamaterials</i> , 8th GACM Colloquium on Computational Mechanics, Kassel, Germany. |
| Jun. 20-23, 2019 | <i>MS-11 Novel Computational Methods with Applications in Continuum Mechanics</i> , ICoNSoM 2019, International Conference on Nonlinear Solid Mechanics, Rome, Italy. |
| Apr. 18, 2019 | <i>Multiphysics Modeling of Battery</i> , advanced seminar held at the Institute of Mechanics, Technische Universität Berlin, co-organized with WIAS Berlin, sponsored by the Daimler and Benz Foundation |
| Apr. 15, 2019 | <i>Constitutive Theory for Modeling the World</i> , scientific colloquium held at the Institute of Mechanics, Technische Universität Berlin |
| Sep. 3-5, 2018 | <i>Generalized continua in engineering</i> , advanced seminar held at the Institute of Mechanics, Technische Universität Berlin, co-organized with W. H. Müller and H. Altenbach. |
| Nov. 6-7, 2017 | <i>New developments in micropolar theory</i> , international workshop held at the Institute of Mechanics, Technische Universität Berlin, co-organized with W. H. Müller and E. N. Vilchevskaya. |

REVIEWING ACTIVITIES:

- 2018-2023** Editor of many monographs in Advanced Structured Materials, Springer Nature
- 2025-2030** Editorial Board in Mathematics and Mechanics of Complex Systems, MSP
- 2023-2026** Editorial Advisory Board in Acta Mechanica, Springer Nature
- 2021-2025** Editorial Board in ZAMM - Journal of Applied Mathematics and Mechanics, Wiley
- 2024-2026** Editorial Board in Discover Applied Sciences, Springer Nature
- 2021-2023** Editorial Board in Frontiers in Materials, Mechanics of Materials, Frontiers
- 2020-2023** Editorial Board in SN-Applied Sciences, Springer Nature
- 2020-2023** Editorial Board in Materials, MDPI
- 2018-2019** Editorial Board in BMC Mechanical Engineering, Springer Nature
- 2019-2023** Reviewer in CompMech - Computational Mechanics, Springer
- 2019** Reviewer in IJSS - International Journal of Solids and Structures, Elsevier
- 2018-2023** Reviewer in ZAMM - Journal of Applied Mathematics and Mechanics, Wiley
- 2017-2023** Reviewer in CMAT - Continuum Mechanics and Thermodynamics, Springer
- 2020-2023** Reviewer in ACMA - Applied Composite Materials, Springer
- 2020-2021** Reviewer in AOAM - Archive of Applied Materials, Springer
- 2020** Reviewer in SN-Applied Sciences, Springer Nature
- 2017-2020** Reviewer in AeroJ - The Aeronautical Journal, Cambridge University Press
- 2017** Reviewer in TCAS - Transactions on Circuits and Systems I: Regular Papers, IEEE
- 2020** Reviewer in RNDE - Research in Nondestructive Evaluation, ASNT
- 2019** Reviewer in Applied Sciences, MDPI
- 2018-2021** Reviewer in Materials, MDPI
- 2017** Reviewer in Fluids, MDPI
- 2020** Reviewer in Mathematics, MDPI
- 2020-2021** Reviewer in Symmetry, MDPI
- 2020** Reviewer in Micromachines, MDPI
- 2020** Reviewer in Instruments, MDPI
- 2018-2021** Reviewer in BMEO - BioMedical Engineering Online, BMC Springer Nature
- 2018-2019** Reviewer in IPVP - International Journal of Pressure Vessels and Piping, Elsevier