# Curriculum Vitae

**Assoc.Prof. Dipl.-Ing Dr.techn. Manfred Ulz**

**Personal Data**


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| Affiliation | Institute of Strength of Materials, Graz University of Technology, Kopernikusgasse 24/I, 8010 Graz, Austria |
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**Academic Milestones**

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| Oct. 2000 – Sep. 2005 | **Diplom- Ingenieur** (with distinction) in Mechanical Engineering-Economics, Graz University of Technology, Austria |
| Aug. 2004 – Feb. 2005 | **Diploma Thesis** – "Vibration control of plate-like structures" at Victoria University of Technology, Melbourne, Australia; a self-organised exchange programme |
| Jul. 2005 – Sep. 2005 | **Internship** in ALICE group at CERN, Geneva, Switzerland - Structural building of ion detector |
| Oct. 2005 – Mar. 2009 | **Doktor der technischen Wissenschaften** (with distinction) in Mechanical Engineering, Graz University of Technology, Austria<br>**Doctoral Thesis** (supervisor Prof. Christian Celigoj) – "A Green-Naghdi approach to finite anisotropic rate-independent and rate-dependent thermo-plasticity in logarithmic Lagrangean strain-entropy space" |
| Oct. 2005 – Oct. 2009 | **Scientific Assistant** at Institute of Strength of Materials, Graz University of Technology, Austria |
| Feb. 2010 – Dec. 2010 | **Post-Doctoral Fellow** at Department of Mechanical Engineering, University of California at Berkeley, USA (group of Prof. Panayiotis Papadopoulos) |
| Jan. 2011 – Jun. 2016 | **Assistant Professor** at Institute of Strength of Materials, Graz University of Technology, Austria |
| since Jan. 2011 | **Deputy Head** of the Institute of Strength of Materials, Graz University of Technology, Austria |
| Sep. 2014 | **Research stay** at the Courant Institute of Mathematical Sciences, New York University, NY, USA |
| Jan. 2011 – May 2016 | **Habilitation** in the field "mechanics", Graz University of Technology, Austria; Habilitation Thesis - "Atomistic-on-continuum coupling with applications to spatial averaging of atomistic stress and hierarchical multiscale methods" |
| since Jul. 2016 | **Associate Professor** at Institute of Strength of Materials, Graz University of Technology, Austria |

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| Jan. 2019 | **Research stay** at the Department of Applied Mechanics, Indian Institute of Technology Madras, Chennai, India |

**Main areas of research**

Computational Mechanics, in particular:

(i) Investigation of atomistic-to-continuum coupling in solid mechanics. Application of molecular dynamics on the atomistic level and finite element method on the continuum level in concurrent and hierarchical multiscale settings. Researching the choice of the spatial averaging domain in atomistic definitions of continuum quantities (stress, heat flux, etc.).

(ii) Researching the multiplicative and additive approach to thermo-plasticity including the plastic spin concept.

(iii) Developing a viscoelastic-viscoplastic model suitable for pulp fibres. Extending to deformation-diffusion coupling for modelling paper curling. Model calibration with data from DMA and AFM experiments.

**Academic research achievements**

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| Oct. 2014 | **Award for excellent teaching** in the category "Young Teachers" – Graz University of Technology, Austria |
| Oct. 2016 | **Invitation as a lecturer** on "Statistical Mechanics" at COMMAS Summer School 2016 October $10^{th}$-$14^{th}$ at the University of Stuttgart, Germany |
| since Jun. 2017 | **Key researcher** in the "CD Laboratory for Fiber Swelling and Paper Performance" at Graz University of Technology |
| Jun. 2018 | **Approval of grant** "DST-BMWFW Joint Call for Proposals: India-Austria Scientific & Technological Cooperation Programme" for 2018-2020" (in cooperation with Assoc.Prof. P. Ghosh, IIT Madras), No. IN 24/2018, 17510 Euro |
| Academic responsibilities | **Supervision** of 2 ongoing dissertations,<br>supervision of 9 successfully completed and 1 ongoing Master's theses |
| Scientific community | **Referee** for: Journal of the Mechanics and Physics of Solids, Computer Methods in Applied Mechanics and Engineering, Applied Mechanics Reviews, Modelling and Simulation in Materials Science and Engineering, International Journal of Solids and Structures, Technische Mechanik, Journal of Mining and Metallurgy - Section B: Metallurgy, Journal of Physical Chemistry |

**Refereed journal publications of the last 5 years**


1. P. Loidolt, M.H. Ulz, and J. Khinast. Prediction of the anisotropic mechanical properties of compacted powders. Powder Technol., 345:589–600, 2019. DOI: 10.1016/j.powtec.2019.01.048
2. P. Loidolt, M.H. Ulz, and J. Khinast. Modeling yield properties of compacted powder using

a multi-particle finite element model with cohesive contacts. Powder Technol., 336:426–440, 2018. DOI: 10.1016/j.powtec.2018.06.018

3. P.Wurm and M.H. Ulz. A stochastic approximation approach to improve the convergence behavior of hierarchical atomistic-to-continuum multiscale models. J. Mech. Phys. Solids, 95:480–500, 2016. DOI: 10.1016/j.jmps.2016.05.024
4. T. Ebner, U. Hirn, W. J. Fischer, F. J. Schmied, R. Schennach, and M.H. Ulz. A proposed failure mechanism for pulp fiber-fiber joints. BioResources, 11:9596–9610, 2016. DOI: 10.15376/biores.11.4.9596-9610
5. M.H. Ulz. A multiscale molecular dynamics method for isothermal dynamic problems using the seamless heterogeneous multiscale method. Comput. Meth. Appl. Mech. Eng., 295:510–524, 2015. DOI: 10.1016/j.cma.2015.07.019
6. M.H. Ulz. Coupling the finite element method and molecular dynamics in the framework of the heterogeneous multiscale method for quasi-static isothermal problems. J. Mech. Phys. Solids, 74:1–18, 2015. DOI: 10.1016/j.jmps.2014.10.002