

Curriculum Vitae

Wilfried Konrad

Dr. rer. nat. habil. (Palaeontology)
Dr. rer. nat. (Theoretical Physics)
Diplom-Geologe
Diplom-Physiker

Technical University of Dresden
Institute for Botany
Zellescher Weg 20b
D-01062 Dresden
Tel. + 49-351-46336032
Tel. +49-7073-9133909

mail: wilfried.konrad@tu-dresden.de

website: [Department of Geosciences, University of Tübingen](#)

Physics

- 1974 – 1984 Studies in Physics at the University of Tübingen, Degree: Diploma.
Diploma thesis: *An example of nonlinear gravitational shielding* (in german)
- 1984 – 1990 Dissertation, University of Tübingen, Degree: Dr. rer. nat.
Thesis: *Exact solutions of Einsteins Field Equations for Rotating Mass Shells* (in german)
- 1985 – 1986 Postgraduate worker, University of Crete, Iraklion, Greece

Geology & Palaeontology

- 1996 – 2002 Studies in Geology and Palaeontology at the University of Tübingen, Degree: Diploma
Diploma thesis: *A mathematical Model for the Transpiration and Assimilation of Early Devonian Land Plants with Axially Symmetric Telomes*
Diploma field work: *The Sedimentary Basin of Prosilio (near Kozani, Greece)*
- 2004 – 2007 Dissertation, Institute of Geosciences, University of Tübingen
Thesis: *Functional Anatomy and Biophysical Mechanisms of Fluid Transport in Vascular Plants: Implications for Structural Optimisation in Fossil and Extant Plants*
19. December 2012: Habilitation (University of Tübingen), Thesis: *Quantitative Actinopalaeontology: Mathematical Models for Deep-Time Ecology*
- from July, 1999: Postdoctoral worker, [Department of Geosciences, University of Tübingen, Germany](#)
- from February, 2015: Postdoctoral worker, [Institute for Botany, Technical University of Dresden, Germany](#)

Research projects

- 1985 – 1987 Postgraduate worker with the research project *Massenschale* (mass shell) of the German Science Foundation (University of Tübingen, Institute of Theoretical Physics)
- 1999 – 2002: *Development and abilities of various growth forms of Lower Devonian land plants*, funded by the German Science Foundation (University of Tübingen)

- 2003 – 2005: Competence Network Biomimetics *Pflanzen als Ideengeber für die Entwicklung biomimetischer Materialien und Technologien* (University of Tübingen) (<http://www.kompetenznetz-biomimetik.de/>)
- 2006: *Sickerwasserprognose* (Prediction of long-term leaching of contaminants) (Centre for Applied Geosciences, University of Tübingen, funded by the Federal Ministry of Education and Research)
- September 2009: Measurement campaign related to the water transport system of lianas at the neutron source BER II of the Helmholtz-Zentrum Berlin
- 2007 – 2010: *Analysis of drag-reducing air-water interfaces: Identifying technical surfaces which are able to hold persistent air layers according to immersed biological objects*, funded by the German Science Foundation (University of Tübingen)
- 2010 – 2011: *Self-repair mechanisms of plant leaves*, funded by the Federal Ministry of Education and Research (with working group *Functional Morphology and Biomimetics*, Botanical Garden, University of Freiburg, Germany)
- 2012 – 2014: *Hydrotex – Entwicklung funktionalisierter Textilien für hydrodynamisch beanspruchte Grenzflächen* (University of Tübingen, funded by the Federal Ministry of Economics and Technology)
- 2015 – 2018 *Development of longlife blast furnace tuyeres*, funded by the Federal Ministry of Economics and Technology (with [Chair of Botany, Technical University of Dresden](#))

Research visits

- 1985 – 1986 University of Crete (Iraklion, Greece)
- June 1990 Academy of Sciences Budapest (Hungary)
- Mai/Juni 2003 Museum of Natural History (Stockholm, Sweden)
- April 2004 Museum of Natural History (Stockholm, Sweden)
- September 2009 Measurement campaign at Neutron source BERII at Helmholtz-Zentrum Berlin
- April 2017 National Research Institute for Earth Science and Disaster Resilience, Tsukuba (Japan)
- April/May 2017 Faculty of Agriculture, University of Kyoto (Japan)

Reviewer for scientific journals

Acta Biotheoretica	Journal of the Royal Society Interface
Biology Open	Langmuir
Ecohydrology	Plant Cell Reports
Ecological Modelling	Review of Palaeobotany and Palynology
Ecotoxicology and Environmental Safety	Tree Physiology
IWA Journal	Trees
Journal of Integrative Plant Biology	Trends in Plant Science
Journal of Theoretical Biology	Water Resources Research

Honors and awards

- 2008 Dissertation prize of the Faculty of Geosciences (University of Tübingen)
- 2017 Materialica Gold Award (in connexion with the project *Development of longlife blast furnace tuyeres*)
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Publications

- [1] W. Konrad, G. Katul, A. Roth-Nebelsick, and K. H. Jensen. “Xylem functioning, dysfunction and repair: a physical perspective and implications for phloem transport”. In: *Tree Physiology* (2018), tpy097. doi: [10.1093/treephys/tpy097](https://doi.org/10.1093/treephys/tpy097).
 - [2] W. Konrad, G. Katul, A. Roth-Nebelsick, and M. Grein. “A reduced order model to analytically infer atmospheric CO₂ concentration from stomatal and climate data”. In: *Advances in Water Resources* 104 (June 2017), pp. 145–157. doi: [10.1016/j.advwatres.2017.03.018](https://doi.org/10.1016/j.advwatres.2017.03.018).
 - [3] W. Konrad, A. Roth-Nebelsick, and C. Neinhuis. “Epicuticular Wax Formation and Regeneration—A Remarkable Diffusion Phenomenon for Maintaining Surface Integrity and Functionality in Plant Surfaces”. In: *Diffusive Spreading in Nature, Technology and Society*. Springer International Publishing, Dec. 2017, pp. 71–91. doi: [10.1007/978-3-319-67798-9_5](https://doi.org/10.1007/978-3-319-67798-9_5).
 - [4] W. Konrad, J. Burkhardt, M. Ebner, and A. Roth-Nebelsick. “Leaf pubescence as a possibility to increase water use efficiency by promoting condensation”. In: *Ecohydrology* 8.3 (2015), pp. 480–492. doi: [10.1002/eco.1518](https://doi.org/10.1002/eco.1518).
 - [5] W. Konrad, F. Flues, F. Schmich, T. Speck, and O. Speck. “An analytic model of the self-sealing mechanism of the succulent plant *Delosperma cooperi*”. In: *Journal of Theoretical Biology* 336 (Nov. 2013), pp. 96–109. doi: [10.1016/j.jtbi.2013.07.013](https://doi.org/10.1016/j.jtbi.2013.07.013).
 - [6] W. Konrad, M. Ebner, C. Traiser, and A. Roth-Nebelsick. “Leaf surface wettability and implications for drop shedding and evaporation from forest canopies”. In: *Pure and Applied Geophysics* 169.5-6 (July 2012), pp. 835–845. doi: [10.1007/s00024-011-0330-2](https://doi.org/10.1007/s00024-011-0330-2).
 - [7] W. Konrad, C. Apeltauer, J. Frauendiener, W. Barthlott, and A. Roth-Nebelsick. “Applying methods from differential geometry to devise stable and persistent air layers attached to objects immersed in water”. In: *Journal of Bionic Engineering* 6.4 (2009), pp. 350–356. doi: [10.1016/s1672-6529\(08\)60133-x](https://doi.org/10.1016/s1672-6529(08)60133-x).
 - [8] W. Konrad, A. Roth-Nebelsick, and M. Grein. “Modelling of stomatal density response to atmospheric CO₂”. In: *Journal of Theoretical Biology* 253.4 (Aug. 2008), pp. 638–658. doi: [10.1016/j.jtbi.2008.03.032](https://doi.org/10.1016/j.jtbi.2008.03.032).
 - [9] W. Konrad and A. Roth-Nebelsick. “The significance of pit shape for hydraulic isolation of embolized conduits of vascular plants during novel refilling”. In: *Journal of Biological Physics* 31.1 (2005), pp. 57–71. doi: [10.1007/s10867-005-6094-0](https://doi.org/10.1007/s10867-005-6094-0).
 - [10] W. Konrad and A. Roth-Nebelsick. “The dynamics of gas bubbles in conduits of vascular plants and implications for embolism repair”. In: *Journal of Theoretical Biology* 224.1 (Sept. 2003), pp. 43–61. doi: [10.1016/s0022-5193\(03\)00138-3](https://doi.org/10.1016/s0022-5193(03)00138-3).
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