

Prof. Dr.-Ing. Reinhard Hinkelmann

Date and place of birth: November 30th, 1962 in Hamm, Germany

Scientific education

- Diploma degree in Civil Engineering, 1991, University of Hannover
- Doctoral degree (Dr.-Ing.), 1997, University of Hannover
- Habilitation degree (Venia Legendi in Hydromechanics and Hydro-informatics), 2003, University of Stuttgart

Professional experience

1991-1997 Research Assistant at the Institute of Fluid Mechanics and Computer Applications in Civil Engineering, University of Hannover

1997-2000 Senior Engineer at the Institute of Computer Applications in Civil Engineering, Technische Universität Braunschweig

2000-2004 Senior Engineer at the Department of Hydromechanics and Modeling of Hydrosystems, University of Stuttgart

2004- Professor for Water Resources Management and Modeling of Hydrosystems, TU Berlin

Research interests

- Modeling of flow and transport processes in surface waters
- Modeling of flow and transport processes in subsurface systems
- Model development and coupling, high performance computing and hydro-informatics

Selected research projects

- Speaker of DFG Research Training Group 2032/1: Urban Water Interfaces, coordination of 11 partners, 2015-2019. Supervisor of Project N7 (2015-2018): Integrated Modelling Approach for Flow and Reactive Transport in Groundwater Surface Water Interaction Space, H2 (2018-2019): Integral Modelling Approach for Flow and Reactive Transport at Surface Water - Groundwater Interfaces, T3 (2015-2018) and S2 (2018-2019): Three-phase Simulation Model for Odour and Corrosion in Sewer Systems
- UEP II: Placement of Ecologically Oriented Structures into the Panke and Optimisation of its Efficiency, coordination of 6 partners, 2011-2015
- Speaker of DFG Research Unit 581: Coupling of Flow and Deformation Processes for Modeling the Movement of Natural Slopes. Central Sub-project: Project Management, Web-based Information Systems, Software Engineering for Model Coupling, Phase 1: coordination of 4 partners, 2006-2008; Phase 2: coordination of 8 partners, 2009-2013
- DFG Research Unit 581: Sub-project 2: Numerical Simulation of Two-Phase Flow Processes in the Subsurface during Movement of Natural Slopes, Phase 1: 2006-2008; Phase 2: 2009-2012
- ZIM/AIF: Hyd³Flow - Coupling of Hydrological, Hydro-numerical and Hydro-informatics Models for an Improved Flood Prediction, coordination of 3 partners, 2009-2011

Selected publications

Agaoglu,B., Copty,N.K., Scheytt,T. & Hinkelmann,R. (2015): [*Interphase mass transfer between fluids in subsurface formations: A review*](#). Advances in Water Resources, 79, 162-194

Broecker,T., Elsesser,W. Teuber,K., Özgen,I., Nützmann,G., Hinkelmann,R. (2017): *High-resolution simulation of free-surface flow and tracer retention over streambeds with ripples*. Limnologica, Vol. 68, pp. 46-48

Gessner,M.O., Hinkelmann,R., Nützmann,G., Jekel,M. Singer,G., Lewandowski,J., Nehls,T. & Barjenbruch,M. (2014): *Urban Water Interfaces*. Journal of Hydrology, 514: 226-232

- Hinkelmann,R. (2005): *Efficient Numerical Methods and Information-Processing Techniques for Modeling Hydro- and Environmental Systems*. Lecture Notes in Applied and Computational Mechanics, Vol. 21, Springer, Berlin, Heidelberg
- Hou,J., Liang,Q., Simons,F. & Hinkelmann,R. (2013): *A 2D well-balanced shallow flow model for unstructured grids with novel slope source term treatment*. *Advances in Water Resources* 52 (2013), 107–131
- Lange,C., Schneider,M., Mutz,M., Haustein,M., Halle,M., Seidel,M., Sieker,H., Wolter,C. & Hinkelmann,R. (2015): *Model-based design for restoration of a small urban river*. *Journal of Hydro-environment Research* 9, 226-236
- Matta,E., Selge,F., Gunkel,G. & Hinkelmann,R. (2017): *Three-dimensional modeling of wind- and temperature-induced flows in the Icó-Mandantes Bay, Itaparica Reservoir, NE Brazil*. *Water*, 9(10), 772
- Özgen,I., Zhao,J., Liang,D. & Hinkelmann,R. (2016). *Urban flood modeling using shallow water equations with depth-dependent anisotropic porosity*. *Journal of Hydrology*, 541: 1165–1184
- Simons,F., Busse,T., Hou,J. & Hinkelmann,R. (2014): *A model for overland flow and associated processes within the Hydroinformatics Modelling System*. *Journal of Hydroinformatics*, 16 (2), 375-391
- Zhao,J., Özgen-Xian,I., Liang,D., Wang,T. & Hinkelmann,R. (2019): *A depth-averaged non-cohesive sediment transport model with improved discretization of flux and source*. *Journal of Hydrology*, 570: 647-665

Supervised doctoral theses in last 5 years

- Abbasi,A. (2016): *Energy balance and heat storage of small shallow water bodies*. TU Delft, The Netherlands, 2011-2016 / current position: Assistant Professor, Ferdowsi University of Mashhad, Iran
- Agaoglu,B. (2015): *Interphase mass transfer in porous media*. TU Berlin, 2010-2015 / position after thesis: ISIN Engineering, Construction & Project Management, Edirne, Turkey
- Banda,M.S. (2018): *Morphological Development of Meandering Rivers Due to Discharge Reduction*. TU Braunschweig, 2014-2018 / current position: Scientific staff, TU Braunschweig, Germany
- Busse,T. (2015): *HMS - A Component-based Hydroinformatics Modelling System for Integrated Modelling and Model Coupling*. TU Berlin, 2004-2015 / current position: IT Consultant and Water Resources Specialist, Berlin, Germany
- Caviedes Voullieme,D. (2013): *A computational model for the simulation of multidimensional hydrodynamics and transport at the soil-surface interface*. Zaragoza University, Spain, 2009-2013 / current position: Postdoc, BTU Cottbus-Senftenberg, Germany
- Du,M. (2016): *Integrated hydraulic modelling of groundwater flow and river-aquifer exchange in lower valley of Var River*. University Nice-Sophia Antipolis, France, 2013-2016 / current position: Société du Canal de Provence, Aix-en-Provence, France
- Goll,A. (2016): *3D Numerical Modelling of Dune Formation and Dynamics in Inland Waterways*. Université Paris-Est, France, 2011-2016 / position after thesis: Trainee in Civil Engineering, Structure and Permission Directorate, Rhineland-Palatinate, Germany
- Horvath,Z. (2017): *Efficient Large-Scale Real-World Flood Simulations using the Shallow Water Equations on GPUs*. TU Vienna, Austria, 2013-2017 / position after thesis: Scientist staff, TU Vienna, Austria
- Kim,D.E. (2019): *Simple-and-yet-novel approach in flood assessment to overcome data scarcity: High quality DEM and rainfall proxies*. University Nice-Sophia Antipolis, France, 2016-2019 / current position: Postdoc University Nice-Sophia Antipolis, France
- Ladwig,R. (2019): *Adapting the water management to mitigate the impact of multiple stressors on an urban lake: Case study lake Tegel*. TU Berlin, 2015-2018 / current position: Postdoc, University of Wisconsin, Madison, USA
- Lobanova,A. (2018): *The assessment of hydrological impacts of climate change and their implications for water management across scales: from the local to European scale*. TU

Berlin, 2014-2018 / current position: Postdoc Potsdam Institute of Climate Impact Research, Germany

- Li,C.Y. (2014): *Time Series Scenario Composition Framework in Hydroinformatics Systems*. BTU Cottbus-Senftenberg, 2008-2014 / current position: Assistant Professor National Taiwan Ocean University, Keelung, Taiwan
- Mahgoub,M. (2015): *Multi-Dimensional Numerical Simulation of Flow and Salinity Transport Processes in the Nile Estuary in the Context of Sea Level Rise*. TU Berlin, 2011-2015 / current position: BEGIS, Berlin, Germany
- Martinez Noguez,A.I. (2017): *Impacts of fast water infiltration in fault zones and water extraction on land subsidence*. TU Berlin, 2008-2016 / position after thesis: musician
- Matta,E. (2018): *Multi-dimensional Flow and Transport Modeling of a Surface Water Body in a Semi-arid Area: the Case of Ico-Mandantes Bay, Northeast Brazil*. Dissertation, TU Berlin, 2014-2018 / current position: Scientific staff, TU Berlin, Germany
- Notay,V. (2015): *Model Coupling in Hydroinformatics Systems Through the Use of Autonomous Tensor Objects*. BTU Cottbus-Senftenberg, 2007-2015 / position after thesis: Scientific staff, Federal Waterways Engineering and Research Institute, Karlsruhe, Germany
- Özgen,I. (2017): *Coarse Grid Approaches for the Shallow Water Model*. TU Berlin, 2012-2017 / current position: Postdoc, Lawrence Berkeley National Laboratory, California, USA
- Rudnick,R. (2018): *Hydrological modelling of a catchment supported by the discharge of treated wastewater – A comparison of two model concepts*. HU Berlin, 2011-2018 / position after thesis: Scientific staff, Federal Waterways Engineering and Research Institute, Karlsruhe, Germany
- Siebel,R. (2014): *Experimentelle Untersuchungen zur hydrodynamischen Belastung und Standsicherheit von Deckwerken an überströmbaren Erddämmen*. Universität Stuttgart, 2002-2009 / current position: Lahmeyer International, Bad Vilbel, Germany
- Stadler,L. (2015): *Entwicklung von Modellkonzepten für die Simulation von Zweiphasenströmungen in makroporösen Medien*. TU Berlin, 2006-2015 / current position: Scientific staff, Federal Waterways Engineering and Research Institute, Karlsruhe, Germany
- Trauth,N. (2015): *Flow and Reactive Transport Modeling at the Stream-Groundwater Interface: Effects of Hydrological Conditions and Streambed Morphology*. University of Potsdam, 2010-2015 / current position: Scientific staff, Helmholtz-Centre for Environmental Research (UFZ), Leipzig, Germany
- Zavattero,E. (2019): *Integration of surface water modelling in a decision support system: Application to the Lower Var valley, France*. University Nice-Sophia Antipolis, France, 2015-2018 / current position: Engineer and project manager of the Flood Prevention Program in Cannes, France
- Zhang,Q. (2018): *Conceptual Simplifications for Long-term Sediment Transport Simulations*. TU Berlin, 2012-2018 / current position: Staff, G.U.B. Ingenieur AG, Berlin, Germany
- Zhao,J. (2019): *Fully coupled robust shallow water flow and sediment transport model on unstructured grids*. TU Berlin, 2013-2019 / current position: Postdoc Loughborough University, UK

Habilitations

- Dr. Tritthart,M. (2012): *Numerical modelling in hydraulic engineering: hydrodynamics, sediment transport and simulation of hydroecosystems*. Venia Legendi for River Hydraulics and Hydroinformatics, University of Natural Resources and Life Sciences Vienna, Austria
- Dr. Achleitner,S. (2015): *From flood flow generation to impacts and mitigation strategies - Selected studies in hydraulic engineering and hydrology*. Venia Legendi for Hydraulic Engineering and Hydrology, Leopold-Franzens-University of Innsbruck, Austria

Specialties

2005 Author of Springer book: Hinkelmann,R.: *Efficient Numerical Methods and Information-Processing Techniques for Modeling Hydro- and Environmental*

- Systems*. Lecture Notes in Applied and Computational Mechanics, Vol. 21, Springer, Berlin, Heidelberg
- 2006-2013 Speaker of DFG Research Unit 581 (Natural Slope): Coupling of Flow and Deformation Processes for Modeling the Movement of Natural Slopes; 5 subprojects in phase 1 (2006-2008) and 8 subprojects in phase 2 (2009-2013)
- 2009-2013 Member of the IAHR Council (International Association of Hydro-Environment Engineering and Research, worldwide leading organization in hydro- and environmental engineering with more than 2.000 members)
- 2011 Main author together with Zehe,E., Ehlers,W. & Joswig,M.: *Special section on landslides: setting the scene and outline of contributing studies*. *Vadose Zone J.* 10, 473-476
- Since 2011 Member of Scientific Council (Mitglied des wissenschaftlichen Beirates) of Federal Institute of Hydrology (BfG Bundesanstalt für Gewässerkunde), Koblenz, Germany
- 2011-2012 Chair of 10th International Conference on Hydroinformatics - Understanding Changing Climate and Environment and Finding Solutions, Hamburg, 14-18 July, 2012
- 2013-2015 Main Guest Editor together with Lam,K.M., Chen,Q. & Popescu,I. of Special Issue: *Environmental Hydraulics* of International Journal of Hydro-environment Research, Volume 9, Issue 2, July 2015
- 2014-2015 Main Guest Editor together with Liang,Q., Aizinger,V. & Dawson,C. of Thematic Issue: *Robust Shallow Water Models* of International Journal Environmental Earth Sciences, Volume 74, Number 11, December 2015
- 2014-2018 Visiting Professor Kobe University, Japan
- 2015-2019 Speaker of DFG Research Training Group 2032/1: Urban Water Interfaces; close collaboration with Leibniz-Institut of Freshwater Ecology and Inland Fisheries (IGB), Berlin, 11 applicants, 13 doctoral students
- 2017- External Advisor for Quality Assurance of the Master of Science Programme in Euro Hydroinformatics and Water Management; joint programme of 5 European Universities (Nice, Cottbus-Senftenberg, Newcastle, Barcelona, Warsaw)
- 2017- External Examiner of Newcastle University, UK for the Master of Science Programme in Euro Hydroinformatics and Water Management