



Stefan Felder

Senior Lecturer

Stefan is a Senior Lecturer in hydraulic engineering and applied fluid mechanics at the Water Research Laboratory. He holds a Dipl.-Ing. from RWTH Aachen University, Germany and a PhD from the University of Queensland for which he was awarded the Dean's award for Research Higher Degree Excellence. He joined UNSW in 2014, having established and leading the hydraulic engineering research group conducting high-level fundamental and applied research in WRL's

large-scale experimental facilities. Stefan explores advanced experimental methods in the laboratory and at full-scale, to resolve applied and fundamental research challenges in hydraulic engineering. This includes air-water flow phenomena and optimisation of water engineering infrastructure for flow conveyance, fish passage and environmental flows.

He has successfully graduated two PhD students to completion and currently supervises four further PhD students. He has a strong track record of publishing in high-ranking journals comprising more than 31 journal papers and more than 42 peer-reviewed conference papers. Stefan has been a chief investigator in several fundamental and applied research grants, and is a member of the leadership team of the IAHR hydraulics structures committee and a member in Engineers Australia's Sydney Water Panel. Stefan has also been a member of the organisation and scientific committees of several national and international conferences including the IAHR World Congress and the Hydraulics in Water Engineering conferences of Engineers Australia. Within UNSW's School of Civil and Environmental Engineering he is the primary lecturer of the fluid mechanics and hydraulic engineering courses at both undergraduate and postgraduate levels.

Qualifications and affiliations

Dipl.-Ing. (Civil Engineering), RWTH Aachen University, Germany, 2008

PhD (Hydraulic Engineering), Uni of Queensland, 2013

MIEAust (Member of the Institution of Engineers Australia)

IAHR (Member, International Association for Hydro-Environment Engineering and Research)

Professional history

2018-: Senior Lecturer, UNSW WRL

2014-2018: Lecturer, UNSW WRL

2013-2014: Postdoctoral Teaching Assistant, University of Queensland

2009-2013: PhD Scholar, University of Queensland

2008-2009: Project Engineer, FWU, University of Siegen

Expertise

- Energy dissipation & aeration in high-velocity free-surface flows
- Energy dissipation & design optimisation of hydraulic infrastructure
- Aeration and air-water interactions in high-velocity free-surface flows including turbulence & boundary layers properties
- Physical modelling & scale effects & field-scale experiments of air-water flows
- Grass-lined spillways
- UNSW tube fishway project to enable fish passage
- Design of instrumentation & advanced data processing tools
- LIDAR and other remote sensing technologies in hydraulics

Selected journal publications

- Kramer, M., Hohermuth, B., Valero, D., **Felder, S.** (2020) Best practices for velocity estimations in highly aerated flows with dual-tip phase-detection probes. *International Journal of Multiphase Flow*
- Scheres, B., Schüttrumpf, H., **Felder, S.** (2020) Flow Resistance and Energy Dissipation in Supercritical Air-Water Flows Down Vegetated Chutes. *Water Resources Research*
- Smith, G.P., Modra, B.D., **Felder, S.** (2019) Full-scale testing of stability curves for vehicles in flood waters. *Journal of Flood Risk Management*
- Felder, S.**, Hohermuth, B., Boes, R.M. (2019) High-velocity air-water flows downstream of sluice gates including selection of optimum phase-detection probe. *International Journal of Multiphase Flow*
- Montano, L., Li, R., **Felder, S.** (2018) Continuous measurements of time-varying free-surface profiles in aerated hydraulic jumps with a LIDAR. *Experimental Thermal and Fluid Science*
- Felder, S.**, Chanson, H. (2017) Scale effects in microscopic air-water flow properties in high-velocity free-surface flows. *Experimental Thermal and Fluid Science*
- Felder, S.**, Chanson, H. (2018) Air-water flow patterns of hydraulic jumps on uniform beds macroroughness. *Journal of Hydraulic Engineering*
- Felder, S.**, Chanson, H. (2015) Phase-detection probe measurements in high-velocity free-surface flows including a discussion of key sampling parameters. *Experimental Thermal and Fluid Science*