

W.A.T.E.R. Summer School – 7th edition

Oskar Von Miller Institute, Obernach, July 24th -28th, 2023

The Oskar von Miller Institute for Hydraulic Engineering of the Technical University of Munich hosted the 7th edition of the W.A.T.E.R. Summer School, co-organized with the IAHR committee on Experimental Methods and Instrumentation. W.A.T.E.R. Summer School aims to train postgraduate students (doctoral students), researchers, and practitioners who already have a specific knowledge and skill level in fluid mechanics but seek advanced training in state-of-the-art measurement techniques.

The Local Organizing Committee led by Prof. Nils R  ther and Yannic Fuchs kept the tradition of providing rich and high-quality scientific programs. The W.A.T.E.R. Summer School used the laboratory and outside facilities of the well-equipped Institute for Hydraulic Engineering and Water Resources Management in Obernach for parallel hands-on sessions.

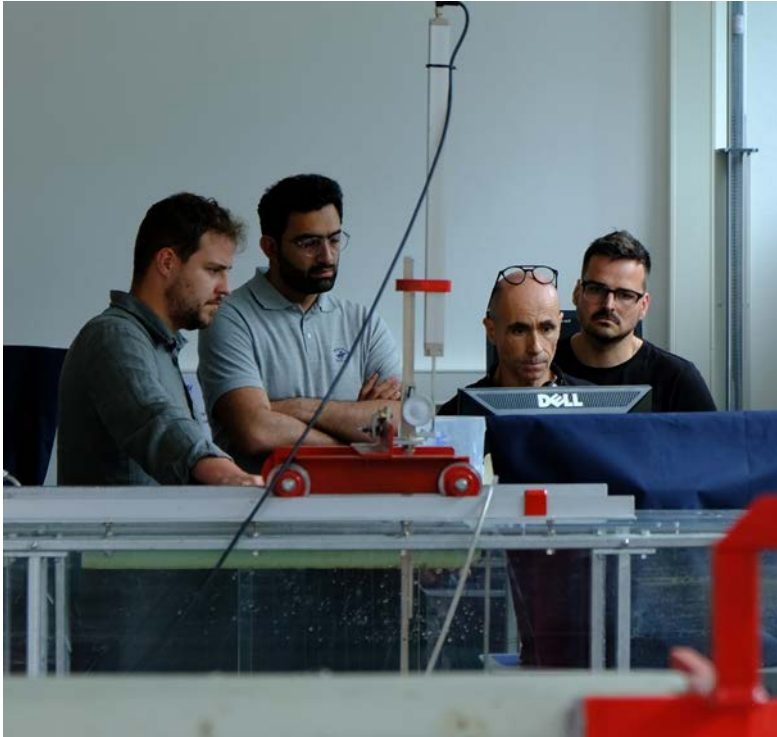
In the 7th edition of the W.A.T.E.R. Summer School, advanced courses on acoustic measurement methods, such as UVP, ADV, and ADCP, as well as optical-based techniques, such as LED-PIV, LSPIV, and PTV, were taught. An advanced course on photogrammetry and structure from motion accomplished the program. For the first time in the W.A.T.E.R. Summer School, novel instrumentation, LISST-AoBS, and portable LISST were introduced to analyze suspension load in an outside flume of the facility, allowing the participants to enlarge their skills and enable a link from lab to field measurements.

The 7th edition was organized by members of the chair of hydraulic engineering of the Technical University of Munich, TUM School of Engineering and Design: Prof. Nils R  ther, Yannic Fuchs, and Antonia Dallmeier. The Oskar von Miller Institute made the resources and experimental installations available with the help of the industry sponsors Ubertone and iLA5150 GmbH.

Fifteen participants, coming from different universities representing ten countries, gathered at TUM to learn about measurement techniques with an international body of lecturers: Marie Burckbuchler (Ubertone, France), Prof. Margaret Chen (Vrije Universiteit Brussel, Belgium), Antonia Dallmeier (TUM, Germany), Prof. Massimo Guerrero (University of Bologna, Italy), Prof. Rui Ferreira (University of Lisboa, Portugal), Rui Aleixo (IST-ID, Portugal), Slaven Conevski (NTNU, Norway), Prof. Nils R  ther (TUM, Germany), Yannic Fuchs (TUM, Germany).

In Groups of three participants, the students learned in hands-on exercises at different test stands the theory and handling of modern instrumentation techniques in fluid mechanics and hydraulic engineering. The practices varied from small-scale tests in fluid mechanics over laboratory experiments in hydraulic engineering to field measurements regarding suspension load. A technical visit to the upper Isar Valley complemented the scientific program. It explained the complex water diversion system from the Isar to the hydropower plant Walchensee and its morphological and biological effects on the alpine catchments.

Thanks to Marie Burckbuchler (Ubertone), the W.A.T.E.R. team could demonstrate innovative UVP instruments, and thanks to Andr   Brunn (iLA 5150 GmbH), the team also presented an LED-PIV. The W.A.T.E.R. Summer School was initiated by Prof. Dr. Margaret Chen from Vrije Universiteit Brussel (Belgium) in 2016, and it was organized under the auspices of the IAHR Technical Committee on Experimental Methods and Instrumentation.



Prof. Rui Ferreira explains the LED-PIV and the measured values.

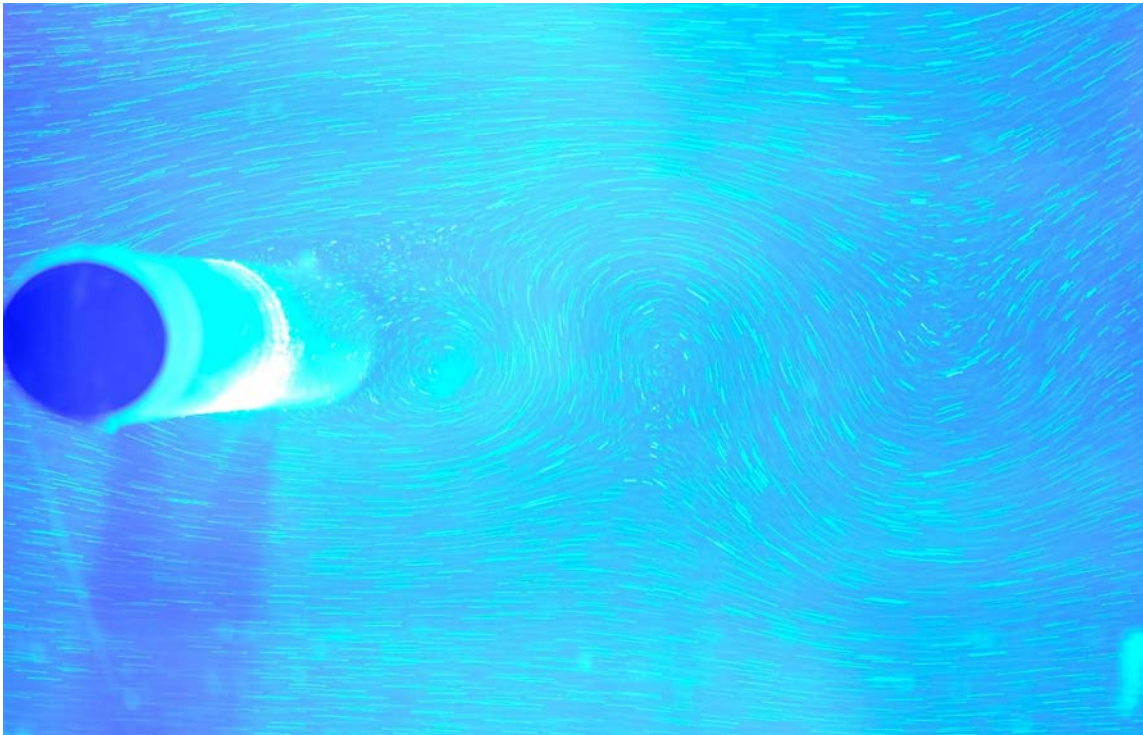
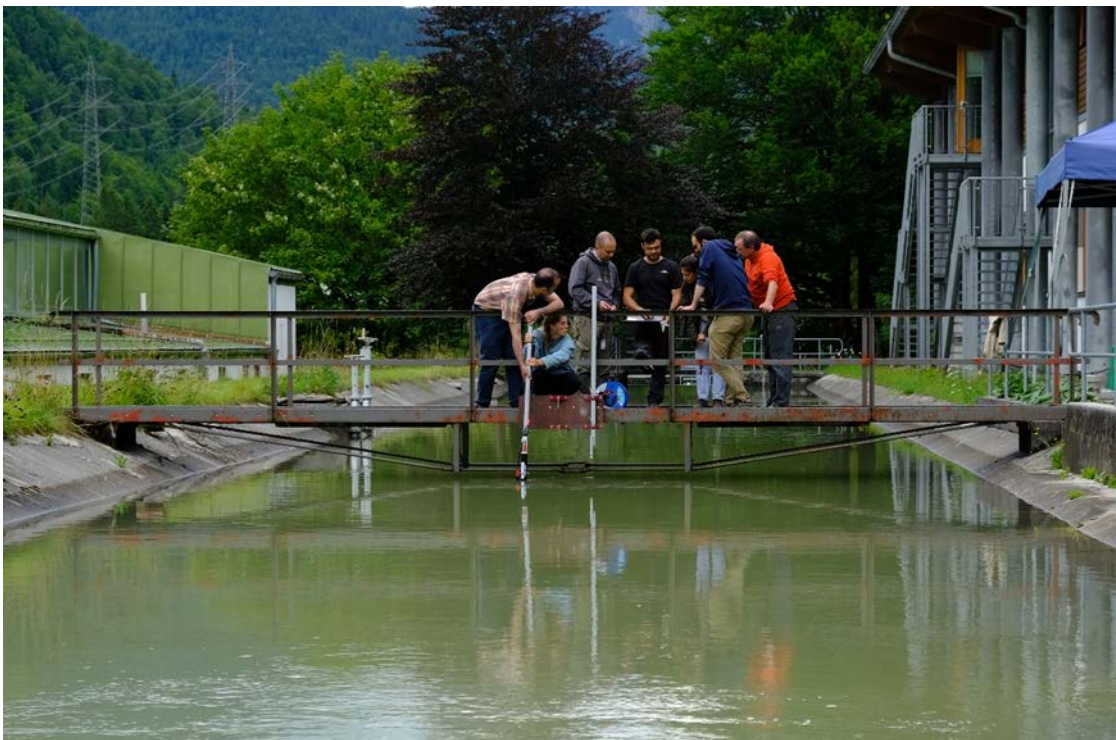


Illustration of Kármán's vortex street, which is formed behind the cylinder.



Marie Burckbuchler explains the results of the UVP.



Slaven Conevski and Massimo Guerrero show and discuss the results of the LISST-AoBS turbidity measurement.



Rui Aleixo explains the method and results of the LSPIV and PTV.



Illustration of the particles used for the PTV measurement.



Students figure out a concept to conduct the structure from motion measurement of a large-scale laboratory experiment.



Field trip to the Rißbach weir.



Participants of the W.A.T.E.R. Summer School – 7th edition.