Technical Committee on Experimental Methods and Instrumentation

Activities of the Year 2025

Including but not limited to conferences, webinars, publications, TC/WG meetings, elections, participation in international processes, etc. Some examples below:

W.A.T.E.R. Summer School – 9th edition, Workshop on Advanced measurement Techniques and Experimental Research, International Summer School on Hydraulics Measurement Techniques

September 1-5, 2025. Gdansk, Poland.

The Institute of Hydro-Engineering of the Polish Academy of Sciences organized the 9th edition of the W.A.T.E.R. Summer School. W.A.T.E.R. Summer School is the flagship event of the EMI Committee and it 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 was composed by Dawid Majewski, Jarosław Biegowski, Krzystof Piłczyński, Maciej Paprota, Małgorzata Robakiewicz, Rui Aleixo and Zuzanna Cuban

This edition welcomed thirteen participants from Finland (2), Germany (1), Italy (1), Luxembourg (1), Netherlands (2), Poland (3), Portugal (1), and Switzerland (2). The panel of invited experts Rui M. L. Ferreira (Instituto Superior Técnico, Universidade de Lisboa), Massimo Guerrero (University of Bologna), Yannic Fuchs (Technical University of Munich), Marie Burckbuchler (Ubertone), and Anne Pallarès and Philippe Schmitt (University of Strasbourg) much contributed to the high scientific level of this event.

This edition showcased different measurement techniques such as Particle Image Velocimetry, Acoustic Doppler Techniques, Particle Tracking Velocimetry, Photogrammetry and instrumentation to be deployed in the field (river and coastal areas). The field measurements session was organized at the Lubiatowo Field station located on the Baltic shore, demonstrating how measurements can be carried out in the sea and in the nearby streams.

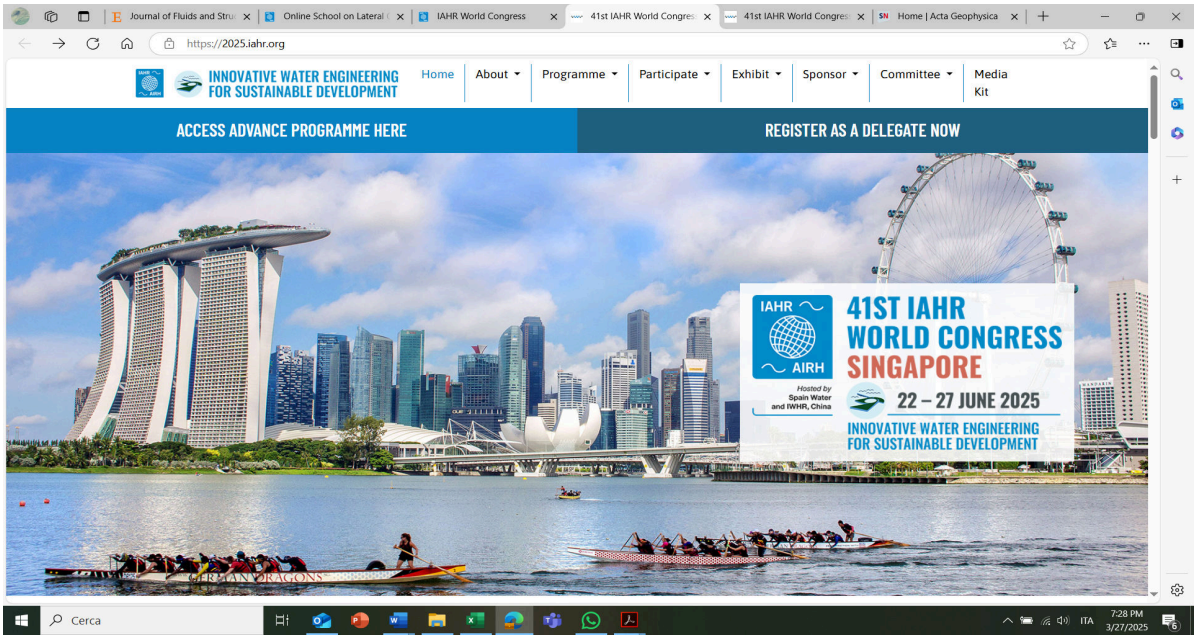
https://iahr.oss-accelerate.aliyuncs.com/upload/file/20260316/1773623805257467.pdf

Special Session at 41th IAHR World Congress: Surrogate techniques for monitoring sediment transport in fluvial and transitional systems

June 22-27, 2025. Singapore.

The proposed session aims to present and discuss the most recent results and experiences achieved by advanced surrogate techniques, such as optical, acoustic and imaging methods.

This Special Session invites contributions that address advanced and novel aspects of measuring sediment transport in rivers and transitional areas using surrogate techniques (e.g., acoustic, optical, imaging, remote sensing). Contributions may cover a variety of topics ranging from field and laboratory studies towards the understanding of fundamental processes, the validation of surrogate methods and the assessment of novel devices, methodology and data analysis performance. Seven contributions were collected.



https://2025.iahr.org/Home/Programme/session-32

EPD activities

The EMI-LT is also actively supporting and participating in EPD activities, such as the YP Challenge and the 6th IAHR Young Professionals Congress.

Isabella Schalko chaired a session on Water Resources Research at the 6th IAHR Young Professionals Congress.

Rui Aleixo and Slaven Conevski served as Chairmen of the session Experimental Methods and Instrumentation & Ecohydraulics at the 6th IAHR Young Professionals Congress, held in Poland from 3 to 5 December 2025 (https://www.iahr.org/index/detail/2079).

Activities of Future Years

Including but not limited to conferences, webinars, publications, TC/WG meetings, elections, participation in international processes, etc.

W.A.T.E.R. Summer School – 10th edition, Workshop on Advanced measurement Techniques and Experimental Research, International Summer School on Hydraulics Measurement Techniques

31 August - 04 September, 2026. Stuttgart, Germany.

The W.A.T.E.R. (Workshop on Advanced measurement Techniques and Experimental Research) Summer School will take place at the Hydraulics Laboratory on the campus of the University of Stuttgart (Germany) from 31 August to 4 September 2026.

The W.A.T.E.R. Summer School is an annual, hands-on training event focusing on advanced measurement techniques in hydraulics and fluid mechanics. It is aimed at PhD candidates, researchers, and professionals seeking in-depth knowledge of state-of-the-art measurement methods. It is organized under the auspices of the Experimental Methods and Instrumentation committee of the IAHR.

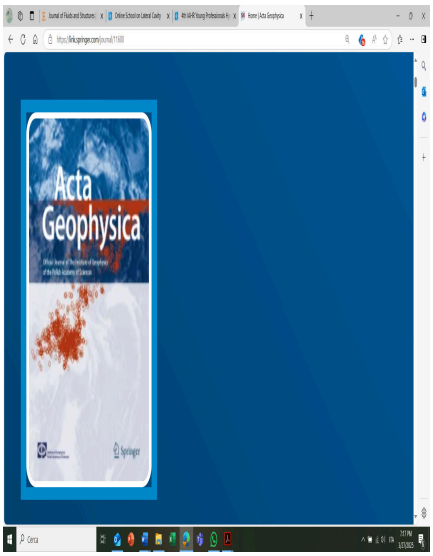
Each edition emphasizes practical experience with measurement techniques such as Acoustic Doppler methods (e.g., UVP and ADVP) and Optical methods (e.g., Particle Image Velocimetry and Particle Tracking Velocimetry), applied to hydraulics problems both in the laboratory and in the field.

https://watersummerschool.wordpress.com/

Recent advances in turbulence and transport measurements and instrumentation in earth surface sciences and hydro-environment engineering

This new special journal session, to be published in Springer's journal Acta Geophysica, offers a unique platform to explore the latest advancements in the tools and methods used for gaining a better understanding of flow turbulence and its impact on transport phenomena, in the context of geosciences and hydraulic engineering.

This session provides an opportunity for academic researchers and industry experts to present cutting-edge research on the development and innovative application of instrumentation, such as lasers, acoustics, and ultrasonics, for measuring and analyzing turbulence and dynamical transport processes, at unprecedented spatiotemporal resolution. By bringing together contributions from diverse areas, the session aims to promote the visibility of valuable research in this critical field and advance knowledge at the forefront of turbulence and transport measurement tools and methods. This session is led by EMI and is planned to be open up to May 31st 2026.



https://link.springer.com/collections/fidjjfaeae

Special Session at 9th IAHR Europe Congress: Advances in Surrogate-Based Monitoring and Numerical Modeling for Reservoir Sedimentation Management

June 9-12, 2026. Lulea, Sweden.

Waiting for validation from organisers.

This Special Session brings together advances in reservoir sedimentation management, numerical modelling, and cutting-edge surrogate techniques for measuring sediment transport processes. We aim to share knowledge, tools, and practical experiences that support the design and implementation of effective, technically sound, and economically viable strategies to counter reservoir sedimentation and related morphological and environmental impacts. A particular focus is placed on integrated monitoring–modelling frameworks, where surrogate measurements (e.g. acoustic backscatter, multibeam bathymetry, image-based velocimetry, remote sensing) support hydro-morphodynamic numerical models of reservoir infilling, delta evolution, and sediment routing.

https://www.ltu.se/en/research/research-subjects/fluid-mechanics/iahr-europe-congress/program/special-sessions

Master Classes at River Flow 2026 - The 13th International Conference on Fluvial Hydraulics

30 June – 4 July, 2026. Thessaloniki, Greece.

INVESTIGATING SEDIMENT FLUXES WITH AN ACOUSTIC DOPPLER CURRENT PROFILER (ADCP)

This Master Class will promote practical ADCP approaches for sediment flux estimation—single/dual-frequency methods, attenuation-based inversions, apparent-velocity and filtering techniques—highlighting when each is appropriate (e.g., gravel vs. sand beds) and how instrument choices (frequency, beam geometry) interact with site constraints (depth, velocity). We will address key challenges arising from flow and sediment heterogeneity, scattering/attenuation through the water column and active layer, and deployment strategy—whether for continuous monitoring or targeted survey mapping.

Researchers working across modelling, laboratory, and field domains are invited to contribute case studies, identify open problems, and share solutions to advance ADCP-based measurement of suspended and bedload transport for river management and engineering.

ASSESSING TURBULENT FLOWS (IN THE LAB USING LASER AND ACOUSTIC METHODS)

River flows and many other geophysical flows are turbulent. All turbulent scales are dynamically connected, from the large motions imposed by geometry, roughness and forcing, down to the smaller scales where local isotropic homogenous conditions might hold. We frequently bring to the lab turbulent processes at the isotropic end of the turbulent kinetic energy cascade. For instance, second and third-order structure functions provide robust estimates of the rate of dissipation of TKE and the Kolmogorov equation can be used to determine spatial scale-filtered energy flux paths from regions of high production to regions dominated by dissipation in wall-bounded flows. We often try to understand how turbulence destroys the memory of the wall-forcing while still transmitting its effects across scales by visualising the structures responsible for the cascade of TKE, for instance using Rortex or other Galilean-invariant vortex identification methods. These results may be used to validate DNS or fine-scaled LES results. But we may also need to account for changes in Reynolds stress anisotropy and transport of TKE, for instance to validate RANS-based models.

Different types of instrumentation may be complementary to characterize turbulence across scales, with Particle Image Velocimetry/Particle Tracking Velocimetry hybrids, acoustic velocimetry and Laser Doppler Anemometry being probably the most widespread methods across labs.

This masterclass seeks to engage students that: i) are in the initial stages of their laboratory research and want to probe different and measuring techniques and data processing techniques; ii) already have laboratory databases of turbulent processes and are willing to discuss the potential of their results; or iii) have been producing numerical databases and are looking for experimental validation. We will bring PIV and acoustic velocimetry databases and suggestions of algorithmic implementation of common data-processing methods, including PIV and Optical Flow in-house software. Depending on the applications, we envisage that the master class can be divided into slots of individual presentations, group discussion and hands-on experimentation.

https://riverflow2026.web.auth.gr/programme/master-classes-short-courses/

WORKSHOP ON ULTRASONIC DOPPPLER

The goal of this workshop is to give the opportunity to Master Students, PhD candidates and curious researchers to discover, use and discuss with peers about Ultrasonic Doppler Methods for Fluid Mechanics and Fluid Engineering.

The content of the workshop will be centered on experimental practice, including exercises of installation, data recording and data processing of UVP (Ultrasonic Velocity Profiler) and/or ADVP (Acoustic Doppler Velocity Profiler) on two laboratory flumes.

A part of the workshop will also be dedicated to peer-to-peer discussions, to discuss measurement needs, methods and applicability of the methods.

Theoretical and lecture-like information will be sent in advance, for the participants to read and study beforehand.

This workshop is organised by the Division of Hydraulics and Environmental Engineering at Aristotle University of Thessaloniki (GR) - Prof Manousos Valyrakis, together with Ubertone (Strasbourg, France) - Marie Burckbuchler.

SEDIMENT FLUXES INVESTIGATION BY MEANS OF THE ACOUSTIC DOPPLER CURRENT PROFILER (ADCP)

EMI will contribute to IAHR Water Monograph Series. A proposed Monograph focuses on use of the Acoustic Doppler Current Profiler, ADCP, to measure sediment fluxes in rivers. ADCPs are used routinely to measure water flow velocity, depth, and discharge. The monograph will review methods developed in the last 20-30 years to analyze the ADCP backscatter ultrasound signal to yield indirect estimates suspended and bedload sediment transport. This proposal is led by Guerrero M. and will gather relevant contributes from Conevski S., Haught D.R., Rennie C., Ruther N. and Venditti J.

The manuscript consists in 4 chapters and 157 pages, which was submitted in January 2026 for peer-reviewing. Publication is expected to be in time for the River Flow Congress in Thessaloniki, 30 June – 4 July, 2026.

https://www.iahr.org/index/detail/659

CREATION OF A SHARED FOLDERS SYSTEM TO FACILITATE COLLABORATION WITHIN EMI-LT AND FOR SUSTAINABILITY OF PROCESSES AND PROJECTS

A shared folder system, with consultation, editing and commenting rights management will be put in place, to :

- Facilitate co-edition of documents, reports, papers
- Share resources (by-laws, etc)
- Create templates for reports etc
- Create sustainable processes
- Facilitate handing information from chair to chair and from LT to LT

CREATION OF SOCIAL NETWORKING CHANNELS

Still to be discussed and decided in more details among:

- EMI Hashtag and/or EMI account
- Concerned networks: LinkedIn, X, others?

Notes and references

LT: Leadership team

TC: Technical committee

FM: https://www.iahr.org/index/committe/2

EPD : Education and Professional Development

YP : Young Professionals