WDSA/CCWI 2026

18-21 May 2026, Paphos, Cyprus

Program Booklet

4th International Joint Conference on Water Distribution Systems Analysis & Computing and Control in the Water Industry

Organizers

University of Cyprus

KOΙΟΣ Research and Innovation Center of Excellence

KWR

water futures

Under the auspices

MINISTRY OF AGRICULTURE RURAL DEVELOPMENT AND THE ENVIRONMENT

Sponsors

PAFOS DISTRICT LOCAL GOVERNMENT ORGANISATION

EOAA ΕΠΑΡΧΙΑΚΟΣ ΟΡΓΑΝΙΣΜΟΣ ΑΥΤΟΔΙΟΙΚΗΣΗΣ ΑΜΜΟΧΩΣΤΟΥ

eoal DISTRICT LOCAL GOVERNMENT ORGANIZATION OF LARNAKA

CARAMONDANI desalination plants "You can depend on us"

Limassol District Local Government Organisation

Technical Supporter

EWRI ASCE ENVIRONMENTAL & WATER RESOURCES INSTITUTE

Table of Contents

Hyperlinks are active throughout the booklet.

Welcome Address by the Co-Chairs

On behalf of the WDSA/CCWI 2026 Organizing Committee, it is our great pleasure to welcome you to Cyprus, to Paphos, and to the 4th International Joint Conference on Water Distribution Systems Analysis and Computing and Control in the Water Industry.

This is the first time that the joint WDSA/CCWI conference is held in Cyprus, hosted in the beautiful coastal city of Paphos. WDSA/CCWI 2026 is organized by the KIOS Research and Innovation Center of Excellence of the University of Cyprus, with support from KWR Water Research Institute and the University of Exeter.

Cyprus is the third largest island in the Mediterranean Sea and has long been a meeting point of cultures, ideas, and civilizations. It is also facing some of the most pressing water challenges in Europe, including drought, water scarcity, ageing infrastructure, and the need for resilient and sustainable water management. This makes it a meaningful location for a conference dedicated to the future of water distribution systems, digital technologies, modelling, control, and decision support.

The technical programme brings together researchers, practitioners, utilities, technology providers, and public authorities from across the world. Participants will have the opportunity to attend keynote and plenary lectures, parallel technical sessions, special sessions, workshops, and interactive discussions covering leakage management, water quality and security, digital twins, smart sensing, modelling and simulation, optimization, control, resilience, and climate adaptation.

We sincerely thank the organizing and scientific committees, session organizers, reviewers, session chairs and co-chairs, keynote speakers, authors, sponsors, supporting institutions, the local organizing team, the conference secretariat, and the many students, researchers, and volunteers whose dedication has made this event possible.

We wish all participants a successful, productive, and stimulating conference, and we hope that WDSA/CCWI 2026 will create lasting scientific exchanges, new collaborations, and memorable experiences here in Cyprus.

Marios Polycarpou & Dragan Savic
Conference Co-Chairs, WDSA/CCWI 2026

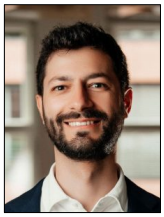
Prof. Marios Polycarpou
Conference Co-Chair

Prof. Dragan Savic
Conference Co-Chair

Organizing Committee

Prof. Marios Polycarpou
Conference Co-Chair
President of International Advisory Board, KIOS Research and Innovation Center of Excellence, University of Cyprus; Professor, Dept. Electrical and Computer Engineering, University of Cyprus; Visiting Professor, Imperial College London, UK; Member of the Cyprus Academy of Sciences, Letters, and Art

Prof. Dragan Savic
Conference Co-Chair
Global Advisor Digital Sciences, KWR; Professor, University of Exeter; Visiting Professor University of Belgrade; Member of the European Academy of Sciences; Fellow of the Royal Academy of Engineering

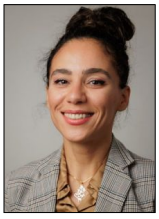


Prof. Andrea Cominola
General Programme Chair
Professor and Head of the Digital Water Systems Lab at the Einstein Center Digital Future and Technische Universität Berlin

Dr. Demetrios Eliades
Special Sessions Programme Chair
Research Assistant Professor, KIOS CoE, UCY

Dr. Stelios Vrachimis
Local Arrangements Chair
KIOS CoE, UCY

Prof. Christos Panayiotou
Finance Chair
ECE Dept/KIOS CoE, UCY



Prof. Farrah Moazeni
Publicity Co-Chair
Lehigh University

Prof. Stefano Alvisi
Publicity Co-Chair
University of Ferrara

Prof. Pedro L. Iglesias-Rey
Publicity Co-Chair
Valencia Polytechnic University

Mr Evripides Kyriakides
Government Liaison
Water Development Deptarment

Dr George Milis
Local Industry Liaison
PHOEBE Innovations Ltd

Ms Christiana Koutsoulli
Communication
KIOS CoE, UCY

Ms Despina Petrou
Administration
KIOS CoE, UCY

International Scientific Committee

Gopinathan R Abhijith, Indian Institute of Technology Kanpur

Ahmed Abokifa, University of Illinois Chicago

André Artelt, Bielefeld University

Mirjam Blokker, KWR Water Research Institute

Dominic Boccelli, University of Arizona

Sriman Pankaj Boindala, Technion – Israel Institute of Technology

Joby Boxall, University of Sheffield

Bruno Brunone, University of Perugia

Steven Buchberger, Professor Emeritus University of Cincinnati

Sandeep Kumar Chittimalli, SMDI / NSF

Ricardo Cobacho, Universitat Politecnica Valencia. Spain

Richard Collins, University of Sheffield

Didia Covas, Instituto Superior Técnico

Enrico Creaco, University of Pavia

Maria C Cunha, University of Coimbra – Portugal

Jochen Werner Deuerlein, 3S Consult GmbH

Kegong Diao, De Montfort University

Huan-Feng Duan, The Hong Kong Polytechnic University

Raziyeh Farmani, University of Exeter

Martínez Alzamora Fernando, Polytechnical University of Valencia, Spain

Yves Filion, Dept of Civil Engineering, Queen's University

Gabriele Freni, University of Enna Kore

Stefano Galelli, Cornell University

Orazio Giustolisi, Politecnico di Bari

James Jinzhe Gong, Deakin University

Barbara Hammer, Bielefeld University

Mashor Housh, University of Haifa

Stewart Husband, University of Sheffield

Pedro L. Iglesias-Rey, Universitat Politécnica de Valencia (Valencia Tech, Spain)

Adesola Ilemobade, School of Civil and Environmental Engineering, University of the Witwatersrand, Johannesburg. South Africa

Zoran Kapelan, Delft University of Technology

Evripides Kyriakides, Water Development Department

Grigorios (Greg) Kyritsakas, Delft University of Technology (TU Delft)

Kevin Lansey, University of Arizona

Juneseok Lee, Manhattan University

Christos Makropoulos, Professor / National Technical University of Athens

Kleanthis Malialis, KIOS Center of Excellence, University of Cyprus

Javier Martinez-Solano, Universidad Politécnica de Valencia

Filippo Mazzoni, University of Ferrara (Italy)

George Milis, PHOEBE Research and Innovation Ltd

Farrah Moazeni, Lehigh University

Alireza Moghaddam, Assistant Professor, University of Gonabad, Gonabad, Iran

Daniel Mora Melia, Polytechnic University of Valencia

Lindell Ormsbee, University of Kentucky USA

Avi Ostfeld, Technion – Israel Institute of Technology

Mathaios Panteli, University of Cyprus

Sotirios Paraskevopoulos, CERTH

Pavlos Pavlou, Water Development Department

Roya Peirovi Minaee, Gonabad University of Medical sciences

Olivier Piller, Senior research scientist, University of Bordeaux

Raido Puust, Tallinn University of Technology

Juan Saldarriaga, Universidad de los Andes

Elad Salomons, Optiwater

Lina Sela, UT Austin

Robert Sitzenfrei, University of Innsbruck

Joaquim José de Oliveira Sousa, Polytechnic University of Coimbra – Civil Engineering Department

Donghwi Jung, Associate Professor, School of Civil, Environmental and Architectural Engineering, Advanced Water Resources Engineering (AWRE) Lab, Korea University

Hwee See, Mott MacDonald

Vanessa Speight, University of Sheffield

Riccardo Taormina, Delft University of Technology

Ezio Todini, Italian Hydrological Society

Jim Uber Uber, Xylem, Inc.

Eloisa Vargiu, CETaqua, Water Technology Center

Tom Walski, Bentley Systems

Zheng Yi Wu, Bentley Fellow, Bentey Systems Incorporated

How to use this booklet

Session and paper code convention

Session boxes use a compact code to indicate when and where the session takes place. The first two letters indicate the day of the week, for example Mo, Tu, We, or Th. The following capital letter indicates the chronological session block within that day, for example A for the first technical block, B for the second block, and C for the third block. The letters after the dot indicate the room, for example Ad for Adonis, Ap for Apollon, Po for Poseidon, Ar for Artemis, and Er for Ermis. Therefore, TuA.Ap means Tuesday, first session block, Apollon room. Individual paper codes extend the session code with the paper order within that session; for example, TuA.Ap1 is the first paper in that session, TuA.Ap2 is the second paper, and so on.

Colour coding of sessions

The programme uses colour-coded boxes to help participants quickly identify the broad type of session in the Program at a Glance. The first letter of the original session identifier corresponds to one of the tracks below.

Colour / code	Session type	High-level description
A	**Track A**	Technical sessions on water distribution leakage management, demand management, operations and controls, asset management, resilience, transients, system modelling and analysis.
B	**Track B**	Technical sessions on water quality, safety and security.
C	**Track C**	Technical sessions on urban drainage, stormwater and wastewater systems.
D	**Track D**	Technical sessions on digital water infrastructures and smart technologies.
E	**Track E**	Technical sessions on climate resilience, sustainability, capacity building, governance and policy.
F	**Track F**	Technical sessions on software tools, simulation engines and platforms.
G	**Special Sessions**	Specially organised sessions addressing focused research themes, emerging topics, and cross-cutting challenges.
SC	**Short Courses**	Short courses providing training, tutorials, and hands-on learning activities.
BWF	**Battle of the Water Futures**	Interactive challenge sessions focused on future water-system scenarios, innovation, and collaborative problem solving.

Author formatting convention

Author names in the detailed technical programme use the following formatting convention:

- **Bold author name**: presenting author.
- *Italic author name*: registered author.
- ***Bold italic author name***: author who is both presenting and registered.
- Author name followed by *(online)*: author participating online.

Venue maps

Venue floor plans are included at the in the following section. Use the maps to locate the main conference rooms, including Adonis, Apollon, Poseidon, Artemis, Ermis, and other venue areas. Click here to go to the Venue Floor Plan section.

Note: The exact content of each session is defined by the session title, paper list, and detailed programme entries.

Program at a Glance

Monday, 18 May 2026

Time	Adonis	Artemis	Poseidon
09:00–09:30	Registration (09:00-18:30)		
09:30–11:00	**MoA.Ad** Modern Optimisation for WDS	**MoA.Ar** AI for Water Professionals	
11:00–11:30	Coffee Break		
11:30–13:00	**MoB.Ad** Modern Optimisation for WDS	**MoB.Ar** AI for Water Professionals	
13:00–14:00	Lunch Break		
14:00–15:30	**MoC.Ad** Physics-informed DL surrogates	**MoC.Ar** Water allocation and infrastructure planning	**MoC.Po** Human-centered leak detection
15:30–16:00	Coffee Break		
16:00–17:30	**MoD.Ad** Physics-informed DL surrogates	**MoD.Ar** Water allocation and infrastructure planning	
18:30–20:00	Welcoming reception		

Tuesday, 19 May 2026

Time	Adonis	Apollon	Poseidon	Artemis	Ermis
08:00–08:30	**Conference Opening**				
08:30–09:15	**Lecture 1: Prof. Barbara Hammer**				
09:15–10:00	**Lecture 2: Prof. Jim Uber**				
10:00–10:30	Coffee Break				
10:30–12:30	**TuA.Ad** Water Distribution Leakage Management I p. 21	**TuA.Ap** Water Quality, Safety & Security I p. 22	**TuA.Po** Digital Water Infrastructure & Smart Technologies I p. 24	**TuA.Ar** Interconnected Water-Energy Systems I p. 25	**TuA.Er** Asset Management p. 26
12:30–14:00	Lunch Break				
14:00–16:00	**TuB.Ad** Water Distribution Leakage Management II p. 28	**TuB.Ap** Water Quality, Safety & Security II p. 29	**TuB.Po** Digital Water Infrastructure & Smart Technologies II p. 31	**TuB.Ar** Software Tools, Modeling Engines and Platforms II p. 33	
16:00–16:30	Coffee Break				
16:30–18:30	**TuC.Ad** Demand Management p. 35	**TuC.Ap** Water Quality, Safety & Security III p. 37	**TuC.Po** Urban Drainage, Stormwater & Wastewater Systems I p. 38	**TuC.Ar** Leveraging Digital Twins to Deal with Climate Change p. 39	

Wednesday, 20 May 2026

Time	Adonis	Apollon	Poseidon	Artemis	Ermis
08:30–09:15	**Lecture 3: Prof. Phoebe Koundouri**				
09:15–10:00	**Lecture 4: Prof. Emily Berglund**				
10:00–10:30	Coffee Break				
10:30–12:30	**WeA.Ad** Water Systems Operations & Controls I p. 42	**WeA.Ap** Earth Observation, AI and Digital Tools for Water Quality Management p. 43	**WeA.Po** Urban Drainage, Stormwater & Wastewater Systems II p. 45	**WeA.Ar** Trustworthy Artificial Intelligence in Water Systems I p. 47	**WeA.Er** Industrial Session I p. 48
12:30–14:00	Lunch Break				
14:00–16:00	**WeB.Ad** Water Systems Operations & Controls II p. 50	**WeB.Ap** Software Tools, Modeling Engines and Platforms I p. 52	**WeB.Po** Digital Water Infrastructure & Smart Technologies III p. 53	**WeB.Ar** ICT4WATER Cluster: Showcases from selected projects p. 55	**WeB.Er** Industrial Session II p. 56
16:00–16:30	Coffee Break				
16:30–22:00	Cultural visit (Ancient Theatre of Kourion) and Gala Dinner (Chris Blue Restaurant)				

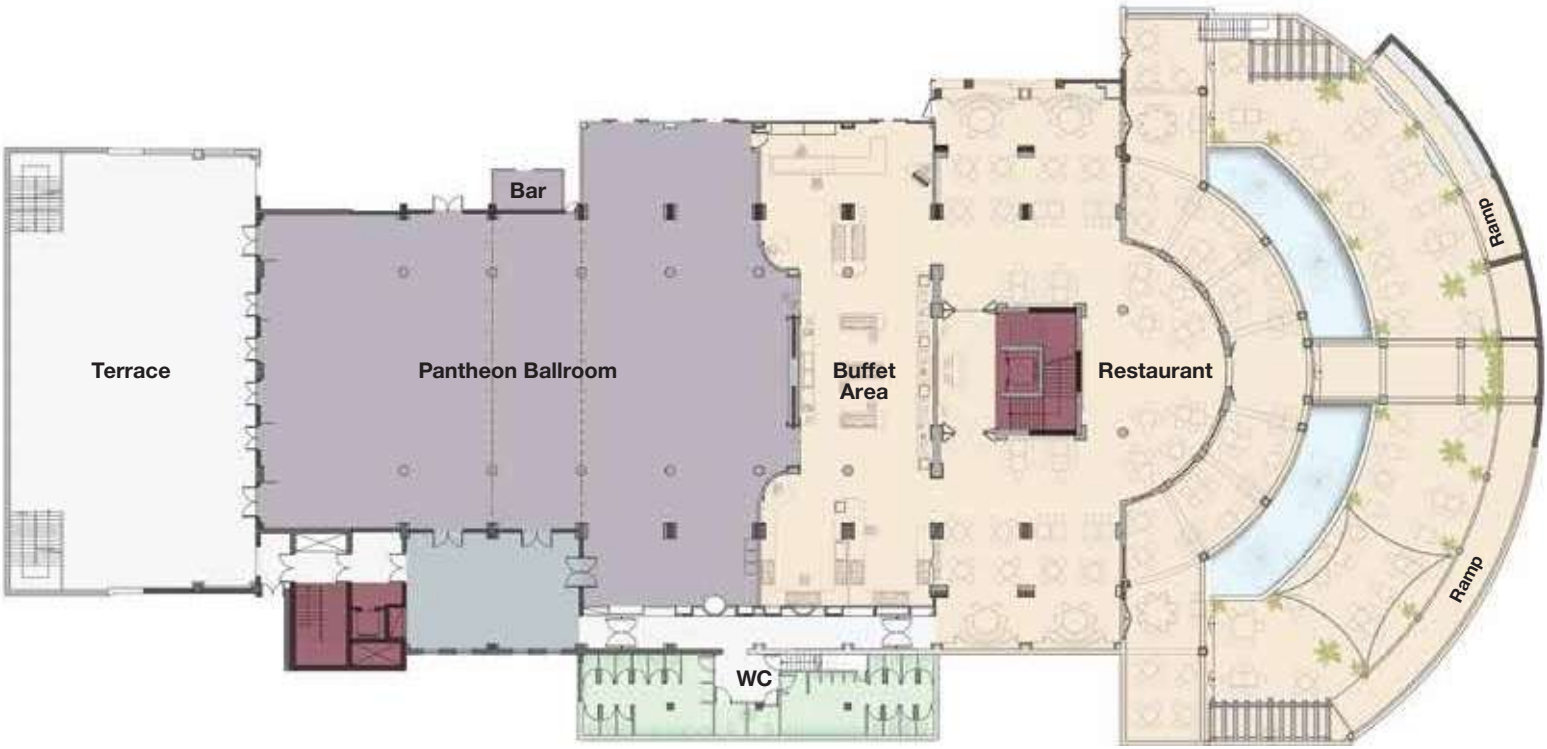
Thursday, 21 May 2026

Time	Adonis	Apollon	Poseidon	Artemis	Ermis
08:30–09:15	**Lecture 5: Socrates Metaxas**				
09:15–10:00	**Plenary Panel**				
10:00–10:30	**Coffee Break**				
10:30–12:30	**ThA.Ad** Water Systems Resilience p. 59	**ThA.Ap** Interconnected Water-Energy Systems II p. 60	**ThA.Po** Climate Resilience & Sustainability p. 61	**ThA.Ar** Digital Water Infrastructure & Smart Technologies IV p. 63	**ThA.Er** Battle of the Water Futures I p. 64
12:30–14:00	**Lunch Break**				
14:00–16:00	**ThB.Ad** Water Distribution System Modelling, Transients and Intelligent Analysis p. 66	**ThB.Ap** Trustworthy Artificial Intelligence in Water Systems II p. 68	**ThB.Po** Capacity Building, Training, Governance and Policy p. 69		**ThB.Er** Battle of the Water Futures II p. 71
16:00–16:30	**Closing Ceremony**				

Venue Floor Plan

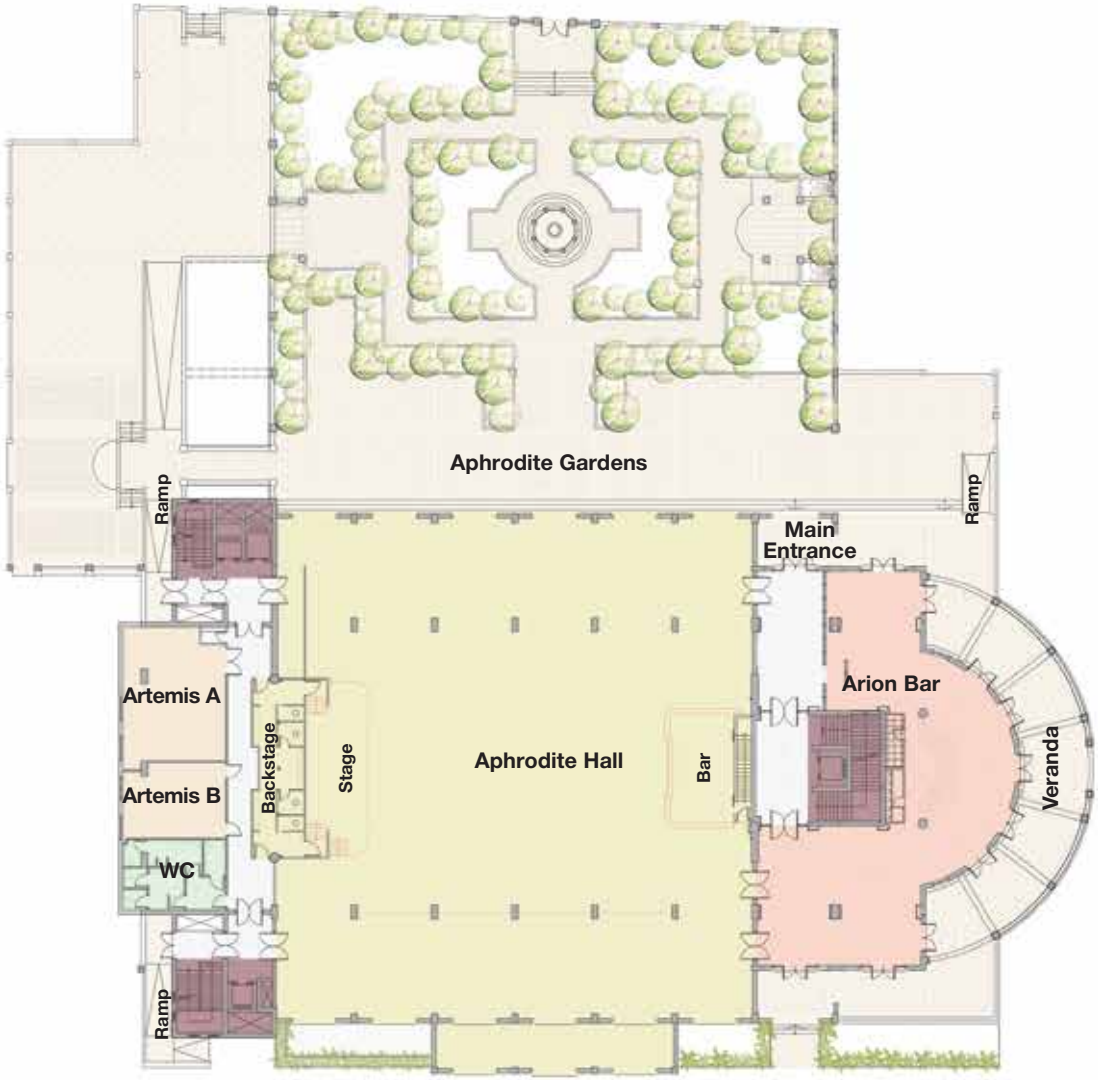
The following pages provide the venue floor plan, including the basement, ground floor, and first floor. The first-floor plan includes the main parallel-session rooms used in the programme, including Adonis, Apollon, Poseidon, Ermis, and Zeus.

Basement



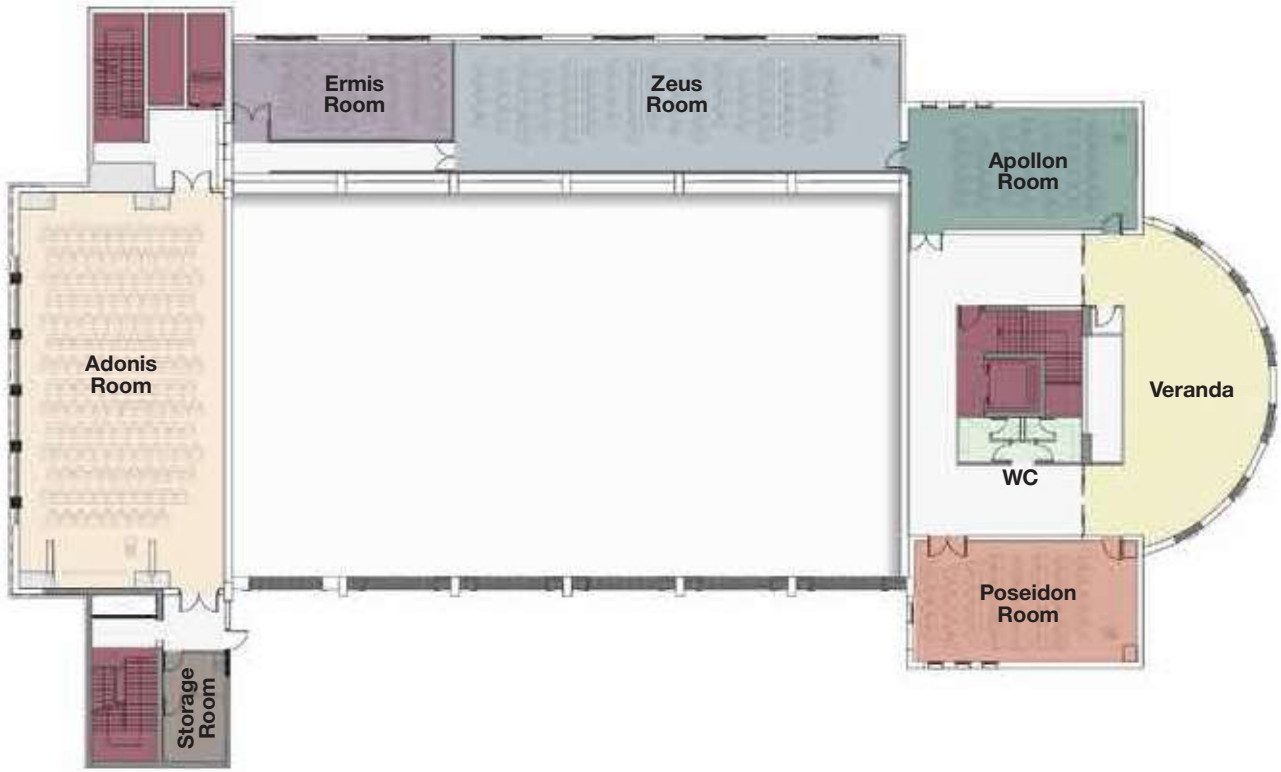
- Pantheon Restaurant
- Lift & Stairway
- WC
- Pantheon Ballroom
- Foyer

Ground floor



- Aphrodite Hall
- Lift & Stairway
- WC
- Artemis (A & B)
- Arion Bar

1st floor



- Poseidon Room
- Apollon Room
- Ermis Room
- Zeus Room
- Adonis Room
- Lift & Stairway
- WC
- Storage Room
- Veranda

Plenary Lecture: 19 May 2026, 08:30-09:15

Session Chair: Dragan Savic

Prof. Barbara Hammer

Challenges and perspectives of machine learning models as efficient surrogates in water distribution systems

Abstract

The increasing availability of smart sensors in water distribution systems (WDS) enables modelling and control to be enhanced by data-driven technologies. Due to their flexibility, modern deep learning methods are particularly promising in this area. Applications of deep learning in WDS range from methods for localising leakages, estimating states as concerns water quality, to optimising pump schedules and supporting the planning of WDS infrastructure. In this talk, I will explore the opportunities and challenges of using deep models for surrogate modelling in WDS. I will discuss how challenges such as hydraulic simulation and state estimation can be modelled as machine learning tasks and tackled by deep learning architectures, particularly graph neural networks. Here, incorporating physical domain knowledge is crucial for valid generalisation in the realm of limited data, leading to novel hybrid models that combine expert domain knowledge and data-driven modelling. Secondly, I will discuss the requirements imposed on machine learning technologies in high-stakes domains such as WDS due to the AI Act of the European Union. Three main requirements are explainability, fairness and robustness of the methods. I will discuss how these requirements can be translated into mathematical objectives and tested for specific models, and I will take a look at technologies that address these requirements.

Short Biography

Barbara Hammer is a full Professor for Machine Learning at the CITEC Research Center at Bielefeld University, Germany. She received her Ph.D. in Computer Science in 1999 and her venia legendi (permission to teach) in 2003, both from the University of Osnabrueck, Germany, where she was head of an independent research group on the topic 'Learning with Neural Methods on Structured Data'. In 2004, she accepted an offer for a professorship at Clausthal University of Technology, Germany, before moving to Bielefeld in 2010. Barbara's research interests cover theory and algorithms in machine learning and neural networks and their application for technical systems and the life sciences, including explainability, learning with drift, nonlinear dimensionality reduction, recursive models, and learning with non-standard data. Barbara has been chairing the IEEE CIS Technical Committee on Data Mining and Big Data Analytics, the IEEE CIS Technical Committee on Neural Networks, and the IEEE CIS Distinguished Lecturer Committee. She has been elected as member of the IEEE CIS Administrative Committee and the INNS Board. She has been an associate editor of the IEEE Computational Intelligence Magazine, the IEEE TNNLS, and IEEE TPAMI. Currently, she is involved in a number of large-scale projects including the DFG collaborative research center on Constructing Explainability, the EU Doctoral Network on Learning with Multiple Representations (LEMUR), the ERC Synergy Grant Smart Water Futures, and the AI Academy OWL funded by BMFTR. Barbara has been selected as member of Academia Europaea.

Plenary Lecture: 19 May 2026, 09:15-10:00

Session Chair: Marios Polycarpou

Prof. Jim Uber

Is a Water Network Digital Twin Worth the Hassle?

Abstract

It can be, depending on how well it helps water utilities solve important problems. The talk will describe some high-value use cases for digital twins, and the requirements those place on backend computational capabilities. Based on trying over the course of many years, I will describe how to implement a digital twin that will be difficult to scale and costly to maintain, while failing to solve important problems. Then – admittedly based on much less experience – I will describe how my colleagues and I have finally found a technological path out of this darkness. That path has been known to some for decades, but often in application areas outside of water systems with few bridges to our community. Doing the work to bring that knowledge into our research and application domain is a worthy endeavour for all of us.

Short Biography

Jim was born in 1960 to Eugene and Lois Uber – Gene a travelling salesman and Lois a registered nurse. He grew up south of Chicago in Park Forest, Illinois, and attended Rich South high school. He was on the wrestling team all four years and made it to the state sectional tournament his senior year in the 119 lb weight class, losing soundly to Tom Gerdes who then went on to take 4th place in the state championship. Early on he liked to take things apart and tinker in the garage, and his parents let him use power tools. He attended Bradley University and graduated in Civil Engineering, a major he picked because he liked to build things, and Civil Engineers built things that he could see. His interests turned toward environmental engineering, and he attended graduate school and received a PhD in Environmental Systems Analysis in 1988, working with E. Downey Brill, Jr. Downey was a wise friend and once described Jim as being "resistant to pressure." In 1990 he joined the environmental engineering faculty at the University of Cincinnati. Early on he had the good fortune to have a project with Lew Rossman of the USEPA, at the time when Lew was writing the first Epanet network modelling engine. Jim has always been "behind the curve" a little, but he kept at it and by about 2002 he could say he sort of knew what he was doing. He spent a couple of years working on-site with the USEPA homeland security research center, which was a productive time interacting with Rob Janke and Regan Murray and figuring out how to deploy sensors and predictive technologies to protect water systems from contamination. He then started a company called CitiLogics with Sam Hatchett and Stu Hooper, to try and bring real-time network modelling to water utilities. That was great fun and they managed to make progress and pay themselves, but Stu died in a tragic accident in 2014, and that loss was tough to take. Sam and Jim sold the business to Xylem in 2018. Jim now still works at Xylem with Sam and a great team of engineers and software developers, on that same dream of making real-time models work and deliver real benefits. It remains a work in progress.

Plenary Lecture: 20 May 2026, 08:30-09:15

Session Chair: Demetrios Eliades

Professor Dr. Phoebe Koundouri

Systems Transformations for Sustainability Transition: Impact Driven Science-based and Stakeholders-validated Pathways

Abstract

This work advances a human-centered, interdisciplinary, and mathematically grounded systems framework for sustainable development, demonstrating how integrated modelling, beyond-GDP valuation, participatory co-design, and sustainable finance can translate the SDGs from ambition into implementation. It addresses interconnected global crises—climate change, biodiversity loss, inequality, fiscal stress, and governance failure—through spatially explicit, data-driven, and socially salient transformation pathways. By coupling AI-ready data infrastructure, integrated assessment models, and stakeholder engagement, the approach bridges science, policy, and markets, embedding climate, biodiversity, and social risks into financial and policy decision-making, and enabling equitable, scalable, and implementable pathways to 2030 and beyond.

Short Biography

Professor Dr. Phoebe Koundouri is a world-leading economist renowned for pioneering human-centred, interdisciplinary, mathematical systems for sustainable nature–society–economy interaction. She holds an MPhil/PhD (Univ. of Cambridge) and has held positions at the Univ. of Cambridge, UCL, LSE, Univ. of Reading, and Tehcnical University of Denmark (DTU). Currently, she is Professor at the Athens University of Economics and Business, Visiting Professor at the Dept. Earth Sciences Univ. of Cambridge and Founder and Director Alliance of Excellence for Research and Innovation in Aeforia AE4RIA (250 researchers). Ranked in the top 2% of scientists (e.g., Stanford list) with 20 books, 700 peered review publications, she has led more than 100 research and innovation projects in 120 countries. In 2025, she was invited by the UN General Secretary to Co-Chair the Global Sustainable Development Report (GSDR) 2027. She serves on the Nominating Committee for the Nobel Prize in Economics. She is a Fellow of Academia Europaea, World Academy of Arts and Sciences (Trustee), European Academy of Sciences and Arts, Academy of Engineering & Technology of the Developing World, IAP, the European Association of Environmental and Resource Economists (EAERE), and European Forest Institute. She served as Commissioner for the Lancet COVID-19 Commission and member of the Fraternal Economy of Integral and Sustainable Development, Pontifical Academy of Social Sciences. Other major distinctions include the ERC Synergy Grant, the Academy of Athens Award of Science, the Award of the Academy of Sciences, Letters, and Arts of the Republic of Cyprus, named World Ambassador of Happiness and Peace (2022), a title conferred by the Government of India at the House of Lords in London. She is the President European Association of Environmental and Resource Economists; President World Council of Environmental Resource Economists Association; Chair UN SDSN Global Climate Hub (2,000 universities); Co-chair UN SDSN Europe (900 universities); Selected editorial roles, editor Elements Book Series in Environmental and Resource Economics (Cambridge University Press); co-editor Environmental and Resource Economics (Official Journal of EAERE, Springer); associate editor Nature: Climate Action (Nature Portfolio). She is ERC Ambassador, EU Climate Pact Ambassador, member of the EIB Climate Leaders Network, and contributor to the IPCC. She advises the UN, G20, World Bank, EC, EIB, EBRD, OECD, WHO, and national governments.

Plenary Lecture: 20 May 2026, 09:15-10:00

Session Chair: Andrea Cominola

Prof. Emily Berglund

Beyond the Pipe: A Sociotechnical Systems Perspective for Water Infrastructure Planning and Management

Abstract

A sociotechnical systems perspective provides a comprehensive approach to understand and manage water infrastructure by moving beyond traditional mechanics to characterize the dynamic interactions between human actors and the built environment. As consumers respond to water quality, economic incentives, and shifting social norms, such as the adoption of water-efficient technologies or the transition to working from home, system demands evolve in complex, non-linear ways. This research presents an agent-based modeling approach to simulate water infrastructure, where agents represent individual households and residents. By coupling agent-based modeling with hydraulic simulation, water flows and quality are updated in response to autonomous human behaviors. This integrated approach represents feedbacks, behaviors, and consumer heterogeneity to capture unexpected changes in infrastructure performance, improve strategic decision-making, and assess equitable access to drinking water. This presentation demonstrates the application of agent-based modeling to assess the performance of drinking water distribution systems across three dimensions. First, a contamination event is used to demonstrate how tight feedback loops between consumers and infrastructure reshape the emergent contaminant plume and inform management decisions. Second, a phased water reuse master plan is modeled by operationalizing the social amplification of risk framework to project adoption and plan infrastructure development. Finally, a COVID-19 scenario is used to assess how household-level heterogeneity affects decision-making around working from home, tap water avoidance, and water affordability. Collectively, these applications demonstrate the power of agent-based modeling to explore emergent outcomes in infrastructure performance and to plan systems that account for consumer adaptation. Ultimately, a sociotechnical perspective provides an important analytical approach to better understand the interactions among consumers, utility providers, and water systems in new and critical contexts, including emerging technologies, infrastructure transitions, and water scarcity.

Short Biography

Dr. Emily Zechman Berglund is a Professor and Associate Head for Faculty Development in the Department of Civil, Construction, and Environmental Engineering at North Carolina State University. After earning her B.S. and M.S. at the University of Kentucky, she completed her Ph.D. at NC State in 2005. Dr. Berglund has since established her research program in the study of sociotechnical systems, specifically examining the feedback loops between human behavior, infrastructure, and environmental change. Her research integrates agent-based modeling, theories of behavioral change, mathematical optimization, and engineering analysis to enhance the resilience of water resources, infrastructure, and communities. Dr. Berglund received NC State's Outstanding Graduate Faculty Mentor Award in 2018 and the ASCE 2026 Margaret S. Petersen Award. Her work has earned multiple Editor's Choice and Best Paper awards from the Journal of Water Resources Planning and Management, including the 2020 Best Seminal Paper Award. Her research program has been supported by the National Science Foundation (NSF), the U.S-Israel Binational Science Foundation, the Environmental Protection Agency (EPA), the National Security Agency (NSA), and various state water and transportation research institutes.

Plenary Lecture: 21 May 2026, 08:30-09:15

Session Chair: Christos Panayiotou

Mr. Socrates Metaxas

From a Water Utility to a Smart Organisation - The transformation Story of Limassol Local Government

Abstract

Climate change, urbanisation, ageing infrastructure, water scarcity and increasing operational complexity are reshaping water utilities worldwide. In water-scarce regions such as Cyprus, these pressures are particularly severe, requiring utilities to evolve beyond traditional operational models towards resilient, integrated and data-driven organisations. This keynote presents the transformation journey of the Limassol District Local Government Organisation, demonstrating how a conventional water utility evolved into a smart organisation through digital transformation, governance reform, innovation and international collaboration. The presentation highlights key challenges faced in Cyprus, including prolonged droughts, increased dependence on desalination, high non-revenue water and rapid urbanisation. Particular emphasis will be placed on the adoption of smart water technologies alongside the role of research collaborations in accelerating organisational transformation. Drawing on more than 30 years of leadership experience, the keynote reflects on challenges and lessons learned concluding with a vision for resilient, agile and intelligent water utilities of the future.

Short Biography

Socrates Metaxas graduated from Lanitio High School in 1982. After completing his military service, he attended the London School of Economics and Political Science, obtaining a degree in Economics in 1987 with a specialisation in Industry & Commerce. In 1988, he earned a Master's degree in Business Administration (MBA) from City University Business School in London. Between 1988 and 1992, he worked at an audit firm in London, where he qualified as a Chartered Accountant. From 1993 until the end of June 2024, he served at the Water Board of Lemesos (WBL), initially as Head of Financial Services, and from 2007 as the WBL's Manager. Following the local government reform, on 1 July 2024, he was appointed as Managing Director of the Limassol District Local Government Organisation (EOA Lemesos).

Panel Discussion: 21 May 2026, 09:15–10:00

Session Chairs: Marios Polycarpou and Dragan Savic

What would Smart Water Systems look like in 2050?

Panelists

- Lina Sela, University of Texas at Austin
- Alexander Sinske, GLS Consulting, South Africa
- Barbara Hammer, Bielefeld University
- Elad Salomons, Optiwater, University of Haifa, Xylem
- Andrea Rubini, Water Europe

Abstract

This panel explores the future of water utilities at the intersection of technology and people. As digitalization, AI, and automation reshape operations, what will the role of water professionals become? This panel moves beyond machines to consider skills, decision-making, and trust in increasingly autonomous systems. Will utilities be run by algorithms, or guided by human judgment? Would you trust AI to manage your water system by 2050? Join us for a forward-looking and provocative discussion on the future of water distribution systems and services.

Detailed Technical Program

Monday, 18 May 2026

Workshop Session 1

MoA.Ad - Modern Optimisation for WDS **SC1**
Workshop / Special Course

Date: Monday, 18 May 2026 **Time:** 09:30–11:00; 11:30–13:00 **Room:** Adonis

Chair: Dragan Savić (KWR Water Research Institute / University of Exeter) **Co-chair:** Lydia Tsiami (KWR Water Research Institute)

MoA.Ar - AI for Water Professionals **SC2**
Workshop / Special Course

Date: Monday, 18 May 2026 **Time:** 09:30–11:00; 11:30–13:00 **Room:** Artemis

Chair: Elad Salomons (Optiwater, University of Haifa, Israel) **Co-chair:** Lina Sela (The University of Texas at Austin), Mashor Housh (University of Haifa)

Workshop Session 2

MoC.Ad - Physics-informed DL surrogates **SC3**
Workshop / Special Course

Date: Monday, 18 May 2026 **Time:** 14:00–15:30; 16:00–17:30 **Room:** Adonis

Chair: André Artelt (Bielefeld University) **Co-chair:** TBD

MoC.Ar - Water allocation and infrastructure planning **SC4**
Workshop / Special Course

Date: Monday, 18 May 2026 **Time:** 14:00–15:30; 16:00–17:30 **Room:** Artemis

Chair: Mirjam Blokker (KWR Water Research Institute / Delft University of Technology) **Co-chair:** TBD

Workshop Session 3

MoC.Po - Human-centered leak detection **SC5**
Workshop / Special Course

Date: Monday, 18 May 2026 **Time:** 14:00–15:30 **Room:** Poseidon

Chair: Andrea Cominola (Technische Universitaet Berlin) **Co-chair:** Ella Steins (Technische Universitaet Berlin)

Tuesday, 19 May 2026

Parallel Session 1

TuA.Ad - Water Distribution Leakage Management I — A1

Regular Session

Date: Tuesday, 19 May 2026 **Time:** 10:30–12:30 **Room:** Adonis

Chair: Andrea Cominola (Technische Universitaet Berlin) **Co-chair:** Ella Steins (Technische Universitaet Berlin)

10:30–10:45 **TuA.Ad1**

Near Real-Time Leak Detection and Localisation Field Results for Small, Medium and Large Water Networks

Alvin Chew, Bentley Systems

Zheng Wu, Bentley Systems

Juen Wong, Bentley Systems

Rony Kalfarisi, Bentley Systems

Fred Cao, Bentley Systems

Meng Xue, Bentley Systems

Jocelyn Pok, Bentley Systems

Hsin Ting Su, Bentley Systems

Joeri Legierse, Evides Waterbedrijf

Robin Wortel, Evides Waterbedrijf

10:45–11:00 **TuA.Ad2**

Near Real-Time Anomaly Detection and Leak Localisation: Field Test Outcomes from a Large Water Utility in North America

Alvin Chew, Bentley Systems

Zheng Wu, Bentley Systems

Juen Wong, Bentley Systems

Jocelyn Pok, Bentley Systems

Meng Xue, Bentley Systems

Fred Cao, Bentley Systems

Rony Kalfarisi, Bentley Systems

Hsin Ting Su, Bentley Systems

11:00–11:15 **TuA.Ad3**

Real-Time Leak Detection and Localization in Water Distribution Networks via Mahalanobis Space Transformation

Oleg Melnikov (online), National Technical University “Kharkiv Polytechnic Institute”

Yurii Dorofieiev, National Technical University “Kharkiv Polytechnic Institute”

Yurii Shakhnovskiy, National Technical University “Kharkiv Polytechnic Institute”

Huy Truong, University of Groningen

Victoria Degeler, University of Amsterdam

11:15–11:30 **TuA.Ad4**

Leak detection in intermittently operated water networks using physics informed machine learning.

Nikhil Narayan, IIT Madras

Sumanth Srinivas Parthasarathy, IIT Madras

Sridharakumar Narasimhan (online), IIT Madras

11:30–11:45 **TuA.Ad5**

Sensitivity analysis of model-based and data-driven leakage detection algorithms

Ella Steins, TU Berlin

Andrea Cominola, TU Berlin

Johannes Koslowski, Kompetenzzentrum Wasser Berlin

11:45–12:00 **TuA.Ad6**

A Real-World Benchmark Dataset for Leakage Detection based on Repairs Records

Andreas Laos, University of Cyprus

Stelios Vrachimis, University of Cyprus

Kleanthis Malialis, University of Cyprus

Marios Kyriakou, University of Cyprus

Demetrios Eliades, University of Cyprus

Marios M. Polycarpou, University of Cyprus

12:00–12:15 **TuA.Ad7**

Data-Driven and Model-Based Approach for Model Calibration and Leak Localization in Water Distribution Systems

Angela Maldonado Alfaro, California State University, Fresno

Carly Boyer, California State University, Fresno

Alessandro Toledo Salazar, California State University, Fresno

Fayzul Pasha, California State University, Fresno

Laura Gonzalez, Universidad de los Andes, Colombia

Jorge Pesantez, California State University, Fresno

12:15–12:30 **TuA.Ad8**

Automating the E-FAVOR Process for Burst Detection - An Industrial Case Study

Bogumil Ulanicki, De Montfort University

Philippe Beaujean, SWDE

Juliaan Plancke, SOFTEAU

Denis Devos, SWDE

Kegong Diao, De Montfort University

TuA.Ap - Water Quality, Safety & Security I

B1

Regular Session

Date: Tuesday, 19 May 2026 **Time:** 10:30–12:30 **Room:** Apollon

Chair: Vanessa Speight (The University of Sheffield) **Co-chair:** Catalina Ortiz Blanco (Polytechnique Montréal)

10:30–10:45 **TuA.Ap1**

Controlled laboratory trials to examine whether sulfamethoxazole will promote antimicrobial resistance in drinking water biofilms in PVC pipes

Victoria Rilstone, BC Government

Yves Filion (online), Queen's University

Pascale Champagne, National Research Council

10:45–11:00 **TuA.Ap2**

Controlling Biofilm Growth Using Nanobubbles: How Fluid Velocity and Turbulence Affect Treatment Effectiveness in Drinking Water Distribution Systems

Ahamed Ashiq, Queen's University

Xiaying Xin, Queen's University

Yves Filion (online), Queen's University

11:00–11:15 **TuA.Ap3**

Unravelling the Temperature-Dependent Growth of Legionella: A Quantitative Meta-Analysis for Accurate Risk Predictions

Catalina Ortiz Blanco, Polytechnique Montréal

Fatemeh Hatam, Polytechnique Montréal

Hunter Quon, Arizona State University

Kerry Hamilton, Arizona State University

Michèle Prévost, Polytechnique Montréal

11:15–11:30 **TuA.Ap4**

Representative Conditions in Drinking Water Quality and Biofilm Studies

Frances Slater, The University of Sheffield

Katherine Fish, The University of Sheffield

Sam Walsh, The University of Sheffield

Dinesh Bhandari, The University of Glasgow

Vanessa Speight, The University of Sheffield

Cindy Smith, The University of Glasgow

Joby Boxall, The University of Sheffield

11:30–11:45 **TuA.Ap5**

Impact of Residual Chlorine Concentration on Coliform Dynamics in Drinking Water Distribution Biofilms

Katherine Fish, The University of Sheffield

Frances Slater, The University of Sheffield

Sam Walsh, The University of Sheffield

Vanessa Speight, The University of Sheffield

Cindy Smith, The University of Glasgow

Joby Boxall, The University of Sheffield

11:45–12:00 **TuA.Ap6**

Fate and Dynamics of Antimicrobial Resistance in Drinking Water Systems

Aswin A Nair, Indian Institute of Technology Kanpur

Muktesh Kumar Sahu, Indian Institute of Technology Kanpur

Saravanan Matheshwaran, Indian Institute of Technology Kanpur

Purnendu Bose, Indian Institute of Technology Kanpur

Gopinathan R. Abhijith, Indian Institute of Technology Kanpur

---

12:00–12:15 **TuA.Ap7**

Impacts of Intermittent Water Supply on Biofilms

Vanessa Speight, The University of Sheffield

Frances Slater, The University of Sheffield

Katherine Fish, The University of Sheffield

TuA.Po - Digital Water Infrastructure & Smart Technologies I **D1**

Regular Session

Date: Tuesday, 19 May 2026 **Time:** 10:30–12:30 **Room:** Poseidon

Chair: George Milis (PHOEBE Research and Innovation Ltd) **Co-chair:** Abel Heinsbroek (Vitens N.V.)

10:30–10:45 **TuA.Po1**

iBWS: A Digital Twin Framework for Autonomous Building Water Quality and Hydraulic Management

Juneseok Lee, Manhattan University

10:45–11:00 **TuA.Po2**

Modern Water Control in the Era of Cloud Computing, Digital Transformation, and Cyber Threats

Shaul Rom, Reali Technologies Ltd.

11:00–11:15 **TuA.Po3**

HydroBIM: Bridging Digital Design and Renewable Energy to an Urban Water Community

Helena Ramos, Instituto Superior Técnico, University of Lisbon

Dídia I.C. Covas (online), Instituto Superior Técnico, University of Lisbon

Nelson Carriço, ISEL- Instituto Politécnico de Lisboa

Ana Paula Falcão, Instituto Superior Técnico, University of Lisbon

---

11:15–11:30 **TuA.Po4**

Calibration of Water Supply Systems with AMI Data

Daniel Weintrob (online), University of Haifa

Mashor Housh, University of Haifa

11:30–11:45 **TuA.Po5**

Fast and physically interpretable data assimilation to support digital twins of urban water systems

Miloš Milašinović, Digital Water Engineering Lab, University of Belgrade - Faculty of Civil Engineering

Željko Vasilić, Digital Water Engineering Lab, University of Belgrade - Faculty of Civil Engineering

---

11:45–12:00 **TuA.Po6**

Building a BIM–GIS Asset Model for Water Network Digital Twins: Deeds and Misdeeds

Linhan Dai (online), The Hong Kong University of Science and Technology

Muhammad Waqar, The Hong Kong University of Science and Technology

Mohamed S. Ghidaoui, The Hong Kong University of Science and Technology

---

12:00–12:15 **TuA.Po7**

Digital Twin based Commissioning for Large-Scale Automation Renewal in Drinking Water Treatment Infrastructure

Abel Heinsbroek, Vitens N.V.

12:15–12:30 **TuA.Po8**

Semantic Behavioural Autonomy for Intelligent Water Systems

Dimitrios Kouzapas, University of Cyprus

Demetrios Eliades, University of Cyprus

TuA.Ar - Interconnected Water-Energy Systems I **G3**

Special Session

Date: Tuesday, 19 May 2026 **Time:** 10:30–12:30 **Room:** Artemis

Chair: Lina Sela (The University of Texas at Austin) **Co-chair:** Faegheh Moazeni (Lehigh University), Mathaios Panteli (KIOS Research and Innovation Center of Excellence and Department of Electrical and Computer Engineering, University of Cyprus)

10:30–10:45 **TuA.Ar1**

Real-time blind controllers for cost-efficient Water Supply Systems operation: a comparative study

Manuel Garruço, University of Aveiro

Ana Luísa Reis, University of Aveiro

Marlene Brás, University of Aveiro

António Andrade-Campos, University of Aveiro

10:45–11:00 **TuA.Ar2**

Multi-Objective Optimization of Surge Control Devices in Water Distribution Systems

Orjuwan Salfety, Technion – Israel Institute of Technology

Avi Ostfeld, Technion – Israel Institute of Technology

11:00–11:15 **TuA.Ar3**

Optimal Pump Operation under Demand and Electricity Tariff Uncertainties

Gal Perelman, Technion – Israel Institute of Technology

Kristina Korder, Technische Universität Ilmenau

Elad Salomons, Optiwater, University of Haifa, Israel

Avi Ostfeld, Technion – Israel Institute of Technology

Pu Li, Technische Universität Ilmenau

11:15–11:30 **TuA.Ar4**

Efficient MILP formulation for Design-Operation Optimization of Water and Energy Systems

Gal Perelman, University of Haifa

Elad Salomons, University of Haifa

Mashor Housh, University of Haifa

11:30–11:45 **TuA.Ar5**

A Case Study on Scalability of Reinforcement Learning for Dynamic Pump Scheduling

Alissa Müller, Bielefeld University

Paul Stahlhofen, Bielefeld University

André Artelt, Bielefeld University

Barbara Hammer, Bielefeld University

11:45–12:00 **TuA.Ar6**

Data-Driven Modelling of Short-Term Energy Consumption in Water Pumping Stations with Limited Flow Measurements

Nikola Hure, University of Zagreb Faculty of Electrical Engineering and Computing

Blaž Korotaj, University of Zagreb Faculty of Electrical Engineering and Computing

Hrvoje Novak, University of Zagreb Faculty of Electrical Engineering and Computing

Tamara Hadjina, Končar - Digital

Mario Vašak, University of Zagreb Faculty of Electrical Engineering and Computing

12:00–12:15 **TuA.Ar7**

Practical Development and Deployment of Capabilities to Reduce Energy Operational Costs in a Large Transmission Network

James G. Uber, Xylem Inc.

Ernesto Arandia-Perez, Xylem Inc.

Masud Rana, Xylem Inc.

Vito Gironda, Xylem Inc.

Sam Hatchett (online), Xylem Inc.

Elad Salomons, Xylem Inc.

TuA.Er - Asset Management

A6

Regular Session

Date: Tuesday, 19 May 2026 **Time:** 10:30–12:30 **Room:** Ermis

Chair: Raziyeh Farmani (University of Exeter / University of Belgrade) **Co-chair:** Tomer Shmaya (University of Toronto)

10:30–10:45 **TuA.Er1**

Corrosion pit shape and the leak-to-burst interval of cast iron pipes

Edward John, The University of Sheffield

Joby Boxall, The University of Sheffield

Richard Collins, The University of Sheffield

Elisabeth Bowman, The University of Sheffield

Luca Susmel, Sheffield Hallam University

10:45–11:00 **TuA.Er2**

Field Evidence of a Standing Water Column Formation in Rural Water Supply Systems

Tomer Shmaya, University of Toronto

Samantha Levalley, University of Toronto

David Meyer, University of Toronto

11:00–11:15 **TuA.Er3**

Identification of a Distribution Network Water Loss Model

Blaž Korotaj, University of Zagreb Faculty of Electrical Engineering and Computing

Tamara Hadjina, Končar - Digital

Hrvoje Novak, University of Zagreb Faculty of Electrical Engineering and Computing

Nikola Hure, University of Zagreb Faculty of Electrical Engineering and Computing

Mario Vašak, University of Zagreb Faculty of Electrical Engineering and Computing

---

11:15–11:30 **TuA.Er4**

Sensitivity of Failure Modelling and Restoration of Water Distribution Networks to the Type of Pipe Damage

Diego Paez, Computational Hydraulics Inc. (CHI)

11:30–11:45 **TuA.Er5**

Fault Asset Detection for Water Distribution System Management

Yejoon Chon, Korea University

Jae Hyuk Kim, Hannam University

Seungyub Lee, Hannam University

Donghwi Jung, Korea University

11:45–12:00 **TuA.Er6**

Strength Assessment of Degraded Asbestos Cement Pipes: Stress Distribution under Transversely Isotropic and Leaching Conditions

Narges Esfandiar, KWR Water Research Institute

Bram Hillebrand, KWR Water Research Institute

Ralph Beuken, KWR Water Research Institute

12:00–12:15 **TuA.Er7**

Balanced Random Forest for Pipe Failure Prediction Under Limited Inventory Data

Giovanni Francesco Santonastaso (online), Università della Campania "Luigi Vanvitelli"

Armando Di Nardo, Università della Campania "Luigi Vanvitelli"

Angelo Leopardi, Università di Cassino e del Lazio Meridionale

---

12:15–12:30 **TuA.Er8**

Analysis of Failures and Maintenance Strategies in Water Distribution Networks

Cristian Cappello, Università degli Studi di Cassino e del Lazio Meridionale

Carla Tricarico, Università degli Studi di Cassino e del Lazio Meridionale

Rudy Gargano, Università degli Studi di Napoli Federico II

Angelo Leopardi, Università degli Studi di Cassino e del Lazio Meridionale

---

Parallel Session 2

TuB.Ad - Water Distribution Leakage Management II **A2**

Regular Session

Date: Tuesday, 19 May 2026 **Time:** 14:00–16:00 **Room:** Adonis

Chair: Gal Perelman (Technion – Israel Institute of Tech- **Co-chair:** Ana Luís Sousa (University of Aveiro)
nology)

14:00–14:15 **TuB.Ad1**

Validation of the zero-crossing rate feature to improve detection of leaks in noisy acoustic environments

Edward John, The University of Sheffield

Yicheng Yu, The University of Sheffield

Richard Collins, The University of Sheffield

Mohammad Reza Shekofteh, The University of Sheffield

Mohammadali Geranmehr, The University of Sheffield

Joby Boxall, The University of Sheffield

14:15–14:30 **TuB.Ad2**

Understanding the Acoustic Behaviour of Leaks in Pressurised Water Pipes

Mohammad Reza Shekofteh, The University of Sheffield

Kirill V. Horoshenkov, The University of Sheffield

Edward John, The University of Sheffield

Joby Boxall, The University of Sheffield

14:30–14:45 **TuB.Ad3**

Model-Free Leak Detection and Localization from Sparse Pressure Data and System Topology

Yifan Huang, The University of Texas at Austin

Lina Sela, The University of Texas at Austin

14:45–15:00 **TuB.Ad4**

Leak Detection and Localization in WSS: An ML-Based Framework for Timely Response

Ana Luís Sousa, University of Aveiro

Eugénio Rocha, University of Aveiro

António Andrade-Campos, University of Aveiro

15:00–15:15 **TuB.Ad5**

Hydraulic Slow Transient Modeling and Sensitivity Analysis for Leakage Detection

Felipe Caro, INRAE

Olivier Piller, Université de Bordeaux

15:15–15:30 **TuB.Ad6**

Supervised Machine Supervised Machine Learning Techniques for Leak Detection in Urban Water Networks

Elizabeth Pauline Carreno Alvarado, Universidade Federal do Paraná

Victor Henrique Alves Ribeiro, Pontifícia Universidade Católica do Paraná (PUC-PR)

Gilberto Reynoso Meza, Pontifícia Universidade Católica do Paraná (PUC-PR)

Cristovão Vicente Scapulatempo Fernandes, Universidade Federal do Paraná (UFPR)

15:30–15:45 **TuB.Ad7**

Prediction of Water Leaks Based on Pressure Variations From Previous Anomalous Events Using Intelligent Data Analysis

Specioza Kimaryo, University College Dublin

Jorge Francés-Chust, Aqlara Ciclo Integral del Agua S.A

David Ayala-Cabrera, CWRR-School of Civil Engineering, University College Dublin

15:45–16:00 **TuB.Ad8**

Enhancing Inverse Transient Method Performance for Leak Detection in Viscoelastic Pipelines by Using a Differentiator-Smoother Filter

Renzo Dusi, University of Brasilia

Alexandre Soares, University of Brasilia

Kleber Silva, University of Brasilia

TuB.Ap - Water Quality, Safety & Security II

B2

Regular Session

Date: Tuesday, 19 May 2026 **Time:** 14:00–16:00 **Room:** Apollon

Chair: Hector Castro Duque (De Montfort University) **Co-chair:** Juan Diego Carvajal Cruz (University of Castilla-La Mancha)

14:00–14:15 TuB.Ap1

Examining the antimicrobial resistance response of drinking water biofilms in PVC distribution pipes when exposed to ciprofloxacin

Victoria Rilstone, BC Government

Yves Filion (online), Queen's University

Pascale Champagne, National Research Council

14:15–14:30 TuB.Ap2

Effect of Nanobubble Exposure On the Structural Integrity of Extra-Cellular Polymeric Substances (EPS) in Drinking Water Biofilms

Ahamed Ashiq, Queen's University

Xiaying Xin, Queen's University

Yves Filion (online), Queen's University

14:30–14:45 TuB.Ap3

How to Account for the Short-Term Variability of Water Age at Branched Dead Ends

Juan Diego Carvajal Cruz, University of Castilla-La Mancha

Sarai Diaz Garcia, University of Castilla-La Mancha

Javier Gonzalez Perez, University of Castilla-La Mancha

14:45–15:00 TuB.Ap4

Integrating Physics - Informed Neural Networks and Ensemble Kalman Filtering for Adaptive Water Quality Modelling in Distribution Systems

Raghad Shamaly, Technion – Israel Institute of Technology

Vikrant Gupta, Guangdong Technion-Israel Institute of Technology

Gopinathan R. Abhijith, Indian Institute of Technology Kanpur

Avi Ostfeld, Technion – Israel Institute of Technology

15:00–15:15 TuB.Ap5

Modeling the Formation of Trihalomethane Species in Water Distribution Systems

Lindell Ormsbee (online), University of Kentucky

Hadley Burchett, University of Kentucky

Brent Vizanko, University of Kentucky

15:15–15:30 TuB.Ap6

Hybrid Reinforcement Learning and Genetic Algorithm Framework for Water Quality Sensor Placement in Water Distribution Networks

Kegong Diao, De Montfort University

Hector Castro Duque, De Montfort University

Liujin Zheng, Guangdong Polytechnic of Environmental Protection Engineering

Xiaochang Huang, Guangdong Polytechnic of Environmental Protection Engineering

Qingnan Xu, Guangdong Polytechnic of Environmental Protection Engineering

Yifan Lin, Guangdong Polytechnic of Environmental Protection Engineering

Miaoting Cai, Guangdong Polytechnic of Environmental Protection Engineering

Teddy Belrain, Affinity Water Limited

Richard Beardsley, Affinity Water Limited

Boguslawa Zazula-Coetzee, Affinity Water Limited

Payal Kapadia, Affinity Water Limited

Lee Wright, Affinity Water Limited

Yessenia Pineda Barrientos, Affinity Water Limited

Bogumil Ulanicki, De Montfort University

15:30–15:45 **TuB.Ap7**

Impact of Solute Mixing Models on Optimal Booster Disinfection Scheduling

Juliana Robles Rivera, Institut National de la Recherche Scientifique - INRS

Reza Yousefian, Institut National de la Recherche Scientifique - INRS

Sriman Pankaj Boindala, Technion – Israel Institute of Technology

Sophie Duchesne, Institut National de la Recherche Scientifique - INRS

Avi Ostfeld, Technion – Israel Institute of Technology

15:45–16:00 **TuB.Ap8**

Experimental Analysis of Solute Mixing at Double-tee Junctions

Juliana Robles Rivera, Institut National de la Recherche Scientifique - INRS

Reza Yousefian, Institut National de la Recherche Scientifique - INRS

Sophie Duchesne, Institut National de la Recherche Scientifique - INRS

TuB.Po - Digital Water Infrastructure & Smart Technologies II

D2

Regular Session

Date: Tuesday, 19 May 2026 **Time:** 14:00–16:00 **Room:** Poseidon

Chair: Daniel Schmitz (RWTH Aachen University) **Co-chair:** Cheima Djemel (INRAE)

14:00–14:15 TuB.Po1

Development of a DHW system model in Modelica to simulate energy use and legionella growth in German building Stock

Daniel Schmitz, RWTH Aachen University

Judith Schüring, RWTH Aachen University

Maximilian Schildt, RWTH Aachen University

Jérôme Frisch, RWTH Aachen University

Christoph van Treeck, RWTH Aachen University

14:15–14:30 TuB.Po2

Uncovering the Drivers of Greenhouse Gas Emissions in Wastewater Treatment Plants via a Data-Driven Causal Network

Chengyu He, Tsinghua University

Shuming Liu, Tsinghua University

14:30–14:45 TuB.Po3

In-situ Verification Technique of Electromagnetic Flowmeters in Water Distribution Networks Based on Error Model and Global Sensitivity Analysis

Jinliang Gao, Harbin Institute of Technology

Yi He, Harbin Institute of Technology

Wenyan Wu, Birmingham City University

Huizhe Cao, Harbin Institute of Technology

Shihua Qi, Heilongjiang Institute of Construction Technology

Ying Liu, Heilongjiang Institute of Construction Technology

Rutao Liu, Harbin Institute of Technology

14:45–15:00 TuB.Po4

Quasi-transient reduced-order model based on graph decomposition and real-time data assimilation

Cheima Djemel, INRAE

Olivier Piller, INRAE

Thierry Horsin, CNAM

Chloé Mimeau, CNAM

Iraj Mortazavi, CNAM

15:00–15:15 TuB.Po5

Data-Driven Thermohydraulic Estimation of Service Pipe Lengths in Water Distribution Networks

Mohammad Tolba, Friedrich-Alexander University

Adithya Ramachandran, Friedrich-Alexander University

Sebastian Brandmayr, Stadtwerke Schrobenhausen

Henrik Christensen, Brønderslev Forsyning A / S

Andreas Maier, Friedrich-Alexander University

Siming Bayer, Friedrich-Alexander University

15:15–15:30 **TuB.Po6**

Uncertainty-Aware Graph Neural Network Surrogates for Wastewater Digital Twins Using Conformal Prediction

Revin Naufal Alief, University of Groningen

Imane El Ghabi, University of Amsterdam

Guy Henckens, Aveco de Bondt

Victoria Degeler, University of Amsterdam

Alexander Lazovik, University of Groningen

Dilek Düştegör, University of Groningen

15:30–15:45 **TuB.Po7**

The Relative Impact of Electricity Price and Water Demand Forecast Accuracy on Water Systems Operations

Hani Ghamkhar, The University of Texas at Austin

Faegheh Moazeni (online), Lehigh University

Lina Sela, The University of Texas at Austin

15:45–16:00 **TuB.Po8**

Insights from interpolating pressure transient metrics in water distribution networks

Carlos Jara-Arriagada (online), Universidad de Aysén

Ivan Stoianov, Imperial College London

TuB.Ar - Software Tools, Modeling Engines and Platforms II

F2

Regular Session

Date: Tuesday, 19 May 2026 **Time:** 14:00–16:00 **Room:** Artemis

Chair: André Artelt (Bielefeld University) **Co-chair:** Anurag Bhambhani (KWR Water Research Institute)

14:00–14:15 TuB.Ar1

A Coupled Stochastic-Hydraulic Framework for Quantitative Microbial Risk Assessment of Biofilm and Pathogen Interactions Within Drinking Water Distribution Systems

Mohamad Bostan, The University of Sheffield

Vanessa Speight, The University of Sheffield

William Sloan, The University of Glasgow

Dinesh Bhandari, The University of Glasgow

Siming You, The University of Glasgow

Joby Boxall, The University of Sheffield

14:15–14:30 TuB.Ar2

A new numerical approach for spectral frequency analysis of pressure dynamics within water distribution networks

Paul Pasquet, IMFT – Institut de Mécanique des Fluides de Toulouse, UMR 5502 – CNRS / Toulouse INP / UT3

Franck Plouraboué, IMFT – Institut de Mécanique des Fluides de Toulouse, UMR 5502 – CNRS / Toulouse INP / UT3

14:30–14:45 TuB.Ar3

Multi-Layer Graph Network Representation for Failure Propagation in Road and Drainage Networks

Mohammad Rajabi, University of Innsbruck

Mohsen Hajibabaei, University of Innsbruck

Guangtao Fu, University of Exeter

David Butler, University of Exeter

Robert Sitzenfrei, University of Innsbruck

14:45–15:00 TuB.Ar4

AI-Enabled Water Distribution Network Management Using an LLM-Based Multi-Agent System

Hemasree G R, Indian Institute of Technology Madras

Glen Philip Sequeira, Indian Institute of Technology Madras

Sam Mathew, Indian Institute of Technology Madras

Sridharakumar Narasimhan (online), Indian Institute of Technology Madras

---

15:00–15:15 TuB.Ar5

A Spatio-Temporal Analytics Framework for Water Network Failure Diagnostics: The Case of Thessaloniki

J.S. Lioumbas (online), Thessaloniki Water Supply and Sewerage Co. S.A.

C. Kotsampoidou, Thessaloniki Water Supply and Sewerage Co. S.A.

A. Christodolou, Thessaloniki Water Supply and Sewerage Co. S.A.

I. Kavouras, Thessaloniki Water Supply and Sewerage Co. S.A.

S. Lazaridis, Thessaloniki Water Supply and Sewerage Co. S.A.

A. Mentes, Thessaloniki Water Supply and Sewerage Co. S.A.

15:15–15:30 TuB.Ar6

A Microbiological Model to Predict the Remaining Lifetime of Natural Rubber Rings in Transport Mains

Anurag Bhambhani, KWR Water Research Institute

Djordje Mitrovic, KWR Water Research Institute

Mirjam Blokker, KWR Water Research Institute

15:30–15:45 **TuB.Ar7**

Hybrid Multi-Species Reactive Transport Models for Water Quality Predictions in Water Distribution Systems

Vagisha Vagisha, Indian Institute of Technology Kanpur

Raghad Shamaly, Technion – Israel Institute of Technology

Avi Ostfeld, Technion – Israel Institute of Technology

Gopinathan R. Abhijith, Indian Institute of Technology Kanpur

---

15:45–16:00 **TuB.Ar8**

EPANET 2.3: Advancing Modelling in Water Distribution Systems Simulations

Marios Kyriakou, KIOS Research and Innovation Center of Excellence, University of Cyprus

Luke Butler, Iterating

Demetrios Eliades, KIOS Research and Innovation Center of Excellence, University of Cyprus

Sam Hatchett (online), Xylem Inc.

Abel Heinsbroek, Vitens N.V.

Oscar Vegas Niño, Aqualia

Lewis A. Rossman, OpenWaterAnalytics (OWA)

Elad Salomons, Optiwater

Alexander Sinske, GLS Consulting

Stelios Vrachimis, KIOS Research and Innovation Center of Excellence, University of Cyprus

Dennis Zanutto, KWR Water Research Institute

Jakobus E. van Zyl, University of Auckland

Parallel Session 3

TuC.Ad - Demand Management

A3

Regular Session

Date: Tuesday, 19 May 2026 **Time:** 16:30–18:30 **Room:** Adonis

Chair: Valentina Marsili (University of Ferrara) **Co-chair:** Milna Mandusic (Norwegian University of Life Sciences)

16:30–16:45 **TuC.Ad1**

Analysis of Hot and Cold Water Consumption of Residential Users Using High-resolution Data

Filippo Mazzoni, University of Ferrara

Valentina Marsili, University of Ferrara

Stefano Alvisi, University of Ferrara

16:45–17:00 **TuC.Ad2**

Spatial Resolution of Demand Modelling in Water Distribution Networks

Mohammadali Geranmehr, The University of Sheffield

Richard Collins, The University of Sheffield

Edward John, The University of Sheffield

Joby Boxall, The University of Sheffield

17:00–17:15 **TuC.Ad3**

Minimum Night Consumption in Water Distribution Networks as a Function of Aggregate Average User Outflows

Carlo Giudicianni (online), Università degli Studi di Pavia

Filippo Mazzoni, Università degli Studi di Ferrara

Valentina Marsili, Università degli Studi di Ferrara

Stefano Alvisi, Università degli Studi di Ferrara

Enrico Creaco, Università degli Studi di Pavia

17:15–17:30 **TuC.Ad4**

A Scenario-Based Approach to Forecasting Peak Water Demand

Anika Stelzl (online), Graz University of Technology

Daniela Fuchs-Hanusch (online), Graz University of Technology

---

17:30–17:45 **TuC.Ad5**

Recurrent Neural Networks for Short-Term Water Demand Forecasting: A Technical Review and Framework for Implementation

Milna Mandusic, Norwegian University of Life Sciences

Vegard Nilsen, Norwegian University of Life Sciences

Abbas Roozbahani, Norwegian University of Life Sciences

17:45–18:00 **TuC.Ad6**

Predicting WDS Zonal Demands Using Deep Learning

Ehsan Roshani, National Research Council of Canada

Pavel Popov, National Research Council of Canada

18:00–18:15 **TuC.Ad7**

Probabilistic deep learning for short-term urban water demand forecasting

Soheil Khosravi, University of Waterloo / Amirkabir University of Technology

John Quilty, University of Waterloo

Mohammad Sina Jahangir, Cornell University / McGill University

Rahim Barzegar, Université du Québec en Abitibi-Témiscamingue (UQAT)

TuC.Ap - Water Quality, Safety & Security III

B3

Regular Session

Date: Tuesday, 19 May 2026 **Time:** 16:30–18:30 **Room:** Apollon

Chair: Konstantinos Glynis (KWR Water Research Institute / Delft University of Technology) **Co-chair:** Stewart Husband (The University of Sheffield)

16:30–16:45 TuC.Ap1

Field Investigation on the Effect of Coagulant Carry-Over on the Occurrence of Metals in the City of Calgary DWDS

Nishana Ramsawak, Queen's University

Yves Filion (online), Queen's University

Sarah Jane Payne, Queen's University

16:45–17:00 TuC.Ap2

Innovative Nanobubble Solutions for Microplastic-Biofilm Management in Drinking Water Distribution Systems

Ahamed Ashiq, Queen's University

Xiaying Xin, Queen's University

Yves Filion (online), Queen's University

17:00–17:15 TuC.Ap3

Data-driven Approaches for Understanding and Improving Mixing in Service Reservoirs

Killian Gleeson, The University of Sheffield

Grigorios Kyritsakas, TU Delft

Stewart Husband, The University of Sheffield

Joby Boxall, The University of Sheffield

17:15–17:30 TuC.Ap4

Exploring the Transferability of Empirical Discolouration Modelling in Trunk Mains

Stewart Husband, The University of Sheffield

Joby Boxall, The University of Sheffield

Killian Gleeson, The University of Sheffield

17:30–17:45 TuC.Ap5

Assessment of Innovative Approaches to Service Reservoir Ingress Monitoring

Jasper Wressell, The University of Sheffield

Kirill V. Horoshenkov, The University of Sheffield

Joby Boxall, The University of Sheffield

17:45–18:00 TuC.Ap6

The Heat Strikes Back: Natural Convection Upstream of a Hot Water Heater

Kevin Vargas, Norwegian University of Science and Technology - NTNU

Mailen Skjervheim, Norwegian University of Science and Technology - NTNU

Michael Waak, SINTEF Community

Franz Tscheikner-Gratl, Norwegian University of Science and Technology - NTNU

Marius Rokstad, Norwegian University of Science and Technology - NTNU

18:00–18:15 **TuC.Ap7**

Risk Assessment of Water Reservoir Systems via Monte Carlo Forecasting

Yutian Wang, KIOS Research and Innovation Center of Excellence, University of Cyprus

Demetrios Eliades, KIOS Research and Innovation Center of Excellence, University of Cyprus

Marios M. Polycarpou, KIOS Research and Innovation Center of Excellence and Department of Electrical and Computer Engineering, University of Cyprus

---

18:15–18:30 **TuC.Ap8**

Self-Cleaning in DWDS under Variable Demand Patterns and Particle Densities

Abazar Fathi, Politecnico di Milano

Giacomo Ferrarese, Politecnico di Milano

Stefano Malavasi, Politecnico di Milano

Mirjam Blokker, KWR Water Research Institute

TuC.Po - Urban Drainage, Stormwater & Wastewater Systems I **C1**

Regular Session

Date: Tuesday, 19 May 2026 **Time:** 16:30–18:30 **Room:** Poseidon

Chair: Dennis Zanutto (KWR Water Research Institute) **Co-chair:** Mohammad Rajabi (University of Innsbruck)

16:30–16:45 **TuC.Po1**

Defect-Level Analysis of Sewer Pipes in Auckland's Urban Drainage System

María A. González, University of Auckland

Juana Herrán, University of Auckland

Jakobus E. van Zyl, University of Auckland

Theunis F.P. Henning, University of Auckland

16:45–17:00 **TuC.Po2**

Smart Sewer Sensors and Field Responses: Operational Evidence Through Blockage and Spill Records from a Regional Sewer Network in Australia

Benny Zuse Rousso, Deakin University

Travis Juffermans, Barwon Water

Michael Thomas, Barwon Water

James, Jinzhe) Gong (Deakin University

17:00–17:15 **TuC.Po3**

Factors influencing 28 types of defects in sewer systems

Juana Herrán, University of Auckland

María A. González, University of Auckland

Jakobus E. van Zyl, University of Auckland

Theunis F.P. Henning, University of Auckland

17:15–17:30 **TuC.Po4**

Sensor Placement in Urban Drainage Networks for Pipe Blockage Detection

Mohammad Rajabi, University of Innsbruck

Mohsen Hajibabaei, University of Innsbruck

Robert Sitzenfrei, University of Innsbruck

17:30–17:45 **TuC.Po5**

Early Detection of Blockages in Urban Sewer Networks

Thi Hai Duong Ninh (online), Adelaide University

Wei Zeng, Adelaide University

Martin Francis Lambert, Adelaide University

Nhu Cuong Do, Adelaide University

17:45–18:00 **TuC.Po6**

Efficient fine-tuning of Vision–Language Models for Sewer Defect Detection

Riccardo Taormina (online), Delft University of Technology

Job van der Werf, Delft University of Technology

18:00–18:15 **TuC.Po7**

Event-based Smart CSO Monitoring Framework and Optimal Sensor Selection Using SWMM and Genetic Algorithm

Lameea Khan, Birmingham City University

Wenyan Wu, Birmingham City University

Waheb A Jabbar, Birmingham City University

Essa Shahra, Birmingham City University

18:15–18:30 **TuC.Po8**

Brown Objects in Water: Computer Vision Analysis of Gross Solids Transport in Sewer Pipes

Tzu-An Lee, The University of Texas at Austin

Lina Sela, The University of Texas at Austin

TuC.Ar - Leveraging Digital Twins to Deal with Climate Change

G8

Special Session

Date: Tuesday, 19 May 2026 **Time:** 16:30–18:30 **Room:** Artemis

Chair: Eloisa Vargiu (Cetaqua, Water Technology Centre) **Co-chair:** Lydia Vamvakeridou-Lyroudia (University of Exeter)

16:30–16:45 TuC.Ar1

Recommendations for updating EU level directives of water policy and governance.

Jessica Penny (online), University of Exeter

Kate Baker, University of Exeter

Albert S. Chen, University of Exeter

Lydia Vamvakeridou-Lyroudia, University of Exeter / KWR Water B.V.

Arvid van Dam, KWR Water B.V.

Stefania Munaretto, KWR Water B.V.

Eloisa Vargiu, CETAQUA

16:45–17:00 TuC.Ar2

Bridging Land and Sea through Digital Twins for Inland Waters: Reference Architecture and Synergies with EDITO and DestinE

Georgina Díez (online), Barcelona Supercomputing Center-Centro Nacional de Supercomputación (BSC-CNS)

Caterina Sarno, Engineering Ingegneria Informatica S.p.A.

Natalia Zamora, Barcelona Supercomputing Center-Centro Nacional de Supercomputación (BSC-CNS)

Marzia Mammina, Engineering Ingegneria Informatica S.p.A.

Simone De Rossi, Engineering Ingegneria Informatica S.p.A.

Gianmarco Urbinati, Engineering Ingegneria Informatica S.p.A.

17:00–17:15 TuC.Ar3

Engagement of stakeholders in the Digital Twin era: insights and experience from Water-Oriented Living Labs

Andrea Rubini, Water Europe

Isabella Gervasio, Water Europe

Anais Baladah, Water Europe

17:15–17:30 TuC.Ar4

Co-Creation of Reference Use Cases in IDEATION: A Stakeholder-Driven Foundation for Inland Water Digital Twins

Franco M. Crivello, Cetaqua, Water Technology Centre

Joan Coines, Cetaqua, Water Technology Centre

Jessica Penny (online), University of Exeter

Kate Baker, University of Exeter

Lydia Vamvakeridou-Lyroudia, University of Exeter

Albert S. Chen, University of Exeter

Miquel Sarrias, Cetaqua, Water Technology Centre

Eloisa Vargiu, Cetaqua, Water Technology Centre

17:30–17:45 TuC.Ar5

A Methodological Framework for the Technological Core Assessment of Digital Twin Systems in Inland Waters: A Use Case of Lake Vico

Gerasimos Antzoulatos, CERTH

Caterina Sarno, Engineering Ingegneria Informatica Spa

Simone De Rossi, Engineering Ingegneria Informatica Spa

Stefanos Vrochidis, CERTH

17:45–18:00 **TuC.Ar6**

Leveraging Large Language Models for Requirements Mapping in Digital Twin Architectures for Inland Waters

Gerasimos Antzoulatos, CERTH

Joan Coines, Cetaqua, Water Technology Centre

Miquel Sàrrias Montón, Water Technology Center

Stefanos Vrochidis, CERTH

18:00–18:15 **TuC.Ar7**

Multi AI Agent Orchestration for Cyber-Physical Security of Drinking Water Systems

George Milis, PHOEBE Research and Innovation Ltd

Demetrios Eliades, KIOS Research and Innovation Center of Excellence, University of Cyprus

Demetrianos Gavriel, PHOEBE Research and Innovation Ltd

Stelios Vrachimis, KIOS Research and Innovation Center of Excellence, University of Cyprus

Dimitrios Kouzapas, KIOS Research and Innovation Center of Excellence, University of Cyprus

---

18:15–18:30 **TuC.Ar8**

OpenKIWAS: Open Knowledge Inventory for Inland Water Systems

Dimitrios Kouzapas, University of Cyprus

Georgina Diez Ventura, Barcelona Supercomputing Center-Centro Nacional de Supercomputación (BSC-CNS)

Caterina Sarno, Engineering Ingegneria Informatica S.p.A.

Kate Baker, University of Exeter

Jessica Penny (online), University of Exeter

Franco M. Crivello, Cetaqua, Water Technology Centre

Gerasimos Antzoulatos, Centre for Research & Technology Hellas (CERTH)

Melissa Latella, Fondazione Centro Euro-Mediterraneo sui Cambiamenti Climatici

Lydia Vamvakeridou-Lyroudia, University of Exeter

Albert S. Chen, University of Exeter

Roberto Di Bernardo, Engineering Ingegneria Informatica S.p.A.

Eloisa Vargiu, Cetaqua, Water Technology Centre

Demetrios Eliades, University of Cyprus

Wednesday, 20 May 2026

Parallel Session 1

WeA.Ad - Water Systems Operations & Controls I — A4

Regular Session

Date: Wednesday, 20 May 2026 **Time:** 10:30–12:30 **Room:** Adonis

Chair: Kristina Korder (Technische Universität Ilmenau) **Co-chair:** Giacomo Ferrarese (Politecnico di Milano)

10:30–10:45 **WeA.Ad1**

Scaling DeePC With Genetic Algorithm Driven PRV Placement in Water Networks: From Exhaustive Search To Optimization

Jason Davda, Technion – Israel Institute of Technology

Avi Ostfeld, Technion – Israel Institute of Technology

10:45–11:00 **WeA.Ad2**

Pressure control optimization of real-word water distribution network in a multicriteria decision-making framework

Daniel Barros, Federal University of Tocantins

Rui Gabriel Souza, Federal University of Minas Gerais (UFMG)

Gustavo Meirelles, Federal University of Minas Gerais (UFMG)

Bruno Brentan, Federal University of Minas Gerais (UFMG)

11:00–11:15 **WeA.Ad3**

Dynamic Modeling and Constrained Feedback Control in Water Distribution Networks: Case Study in a Peripheral Region of a Large Brazilian City

Gabriel Amaral, University of Campinas (UNICAMP)

Luz Alvarez, University of Campinas (UNICAMP)

Edevar Junior, University of Campinas (UNICAMP)

11:15–11:30 **WeA.Ad4**

A Unified Framework for Remote Pressure Control: From Existence and Uniqueness to Cooperative Strategies

Olivier Piller, University of Bordeaux

Jochen Deuerlein, 3S Consult GmbH

Sylvan Elhay, Adelaide University

Angus Simpson, Adelaide University

11:30–11:45 **WeA.Ad5**

Data-Driven Robust Optimization of PRV Operation in Water Distribution Systems under Demand Uncertainty

Lisa Hickl, Technische Universität Ilmenau

Kristina Korder, Technische Universität Ilmenau

Pu Li, Technische Universität Ilmenau

11:45–12:00 **WeA.Ad6**

Voice-Automated, Data-Driven Optimization Framework for Equitable Supply in Water Distribution Networks

Harish Doneparthi, Indian Institute of Technology Madras

Saryu Sundararaman, Government College of Technology, Coimbatore

Satvika Dwaram, Indian Institute of Information Technology, Design and Manufacturing

Sri Hari Prasath Ramprasad, Indian Institute of Technology Madras

Mallikarjun Jamadarkhani, Indian Institute of Technology Madras

Venkata Prakash Nallamothula, Indian Institute of Technology Madras, and University of Birmingham

Varghese Kurian, University of Delaware

Sridharakumar Narasimhan (online), Indian Institute of Technology Madras

---

12:00–12:15 **WeA.Ad7**

Optimal Pump Scheduling in WDNs: Assessing Tank Dynamics Discretisation via Direct Multiple Shooting

Katharina Henn, Technische Universität Darmstadt),Peter F. Pelz (Technische Universität Darmstadt

---

12:15–12:30 **WeA.Ad8**

On the use of numerical models to analyze pressurized irrigation systems through performance indicators

Giacomo Ferrarese, Politecnico di Milano

Gustavo Marini, Università degli Studi del Sannio

Nicola Fontana, Università degli Studi del Sannio

Virginia Rosa Coletta, CNR-IRSA

Umberto Fratino, Politecnico di Bari

Nicola Lamaddalena, Politecnico di Bari

Ivan Portoghese, CNR-IRSA

Stefano Malavasi, Politecnico di Milano

Stefano Mambretti, Politecnico di Milano

Davide Troiani, Politecnico di Milano

Alessandro Pagano, Politecnico di Bari / CNR-IRSA

WeA.Ap - Earth Observation, AI and Digital Tools for Water Quality Management

G5

Special Session

Date: Wednesday, 20 May 2026 **Time:** 10:30–12:30 **Room:** Apollon

Chair: Sotirios Paraskevopoulos (Centre for Research & Technology Hellas (CERTH)) **Co-chair:** Ilias Gialampoukidis (Centre for Research & Technology Hellas (CERTH))

10:30–10:45 **WeA.Ap1**

A Hybrid Digital Twin for Enhanced Water Treatment: Integrating Physics-Based Models, Machine Learning, and Explainable AI in Industrial Use Cases

Grigorios Tzionis, Centre for Research & Technology Hellas (CERTH)

Prodromos Mouratidis, Centre for Research & Technology Hellas (CERTH)

Georgia Kougka, Centre for Research & Technology Hellas (CERTH)

Ilias Gialampoukidis, Centre for Research & Technology Hellas (CERTH)

Stefanos Vrochidis, Centre for Research & Technology Hellas (CERTH)

Ioannis Kompatsiaris, Centre for Research & Technology Hellas (CERTH)

10:45–11:00 **WeA.Ap2**

Towards an AI-based EPANET-MSX Surrogate Model

Janine Strotherm, Bielefeld University

Luca Hermes, Bielefeld University

André Artelt, Bielefeld University

Barbara Hammer, Bielefeld University

11:00–11:15 **WeA.Ap3**

Uncertainty-Aware Short-Term Forecasting of Water Demand Using Data-Driven Models and Conformal Prediction

Hrvoje Novak, University of Zagreb Faculty of Electrical Engineering and Computing

Donata Borić, Končar - Digital

Blaž Korotaj, University of Zagreb Faculty of Electrical Engineering and Computing

Nikola Hure, University of Zagreb Faculty of Electrical Engineering and Computing

Mario Vašak, University of Zagreb Faculty of Electrical Engineering and Computing

---

11:15–11:30 **WeA.Ap4**

Modelling anti-microbial resistance in water networks

Shimon Komarovsky, Technion – Israel Institute of Technology

Gopinathan R. Abhijith, Indian Institute of Technology Kanpur

Sriman Pankaj Boindala, Technion – Israel Institute of Technology

Benedikt M. Aumeier, Technical University of Munich

Amelie Steger, Technical University of Munich

Elad Salomons, Optiwater, University of Haifa, Israel

Jörg E. Drewes, Technical University of Munich

Avi Ostfeld, Technion – Israel Institute of Technology

11:30–11:45 **WeA.Ap5**

Towards an EO-Driven Early-Warning Framework for Water-Quality Hazards Following Flood Events

Vassilios Papaioannou, Centre for Research & Technology Hellas (CERTH)

Dimitrios Valsamis, Centre for Research & Technology Hellas (CERTH)

Anastasia Moumtzidou, Centre for Research & Technology Hellas (CERTH)

Ilias Gialampoukidis, Centre for Research & Technology Hellas (CERTH)

Stefanos Vrochidis, Centre for Research & Technology Hellas (CERTH)

Ioannis Kompatsiaris, Centre for Research & Technology Hellas (CERTH)

11:45–12:00 **WeA.Ap6**

AQUAMON: Advanced Quality Monitoring System of Water in Urban Areas

Emmanuel Raptis, CERTH

Panagiotis Raptis, CERTH

Elias Kosmatopoulos, CERTH

12:00–12:15 **WeA.Ap7**

Fusing Deep Learning and Remote Sensing Data to Estimate Non-Optically Active Water Quality Variables

Vasiliki Thomopoulou, National Technical University of Athens (NTUA)

Panagiotis Kossieris, National Technical University of Athens Research Committee

George Bariamis, National Technical University of Athens (NTUA)

Konstantinos Peroulis, EYDAP S.A.

George Katsouras, EYDAP S.A.

Christos Makropoulos, National Technical University of Athens (NTUA)

12:15–12:30 **WeA.Ap8**

A Framework for Early Warning and Control of Disinfection By-Products in Water Distribution Networks using Digital Twins

Pavlos Pavlou, KIOS Research and Innovation Center of Excellence, University of Cyprus

Alexandros Papadopoulos, KIOS Research and Innovation Center of Excellence, University of Cyprus

Marios Kyriakou, KIOS Research and Innovation Center of Excellence, University of Cyprus

Stelios Vrachimis, KIOS Research and Innovation Center of Excellence, University of Cyprus

Demetrios Eliades, KIOS Research and Innovation Center of Excellence, University of Cyprus

---

WeA.Po - Urban Drainage, Stormwater & Wastewater Systems II — C2

Regular Session

Date: Wednesday, 20 May 2026 **Time:** 10:30–12:30 **Room:** Poseidon

Chair: Luis Romero-Ben (Universitat Politècnica de Catalunya - BarcelonaTech) **Co-chair:** Sara Mota (University of Aveiro)

10:30–10:45 — WeA.Po1

Analysis of the implementation of pollution-based real-time control in urban drainage systems: A case study

Luis Romero-Ben, Universitat Politècnica de Catalunya - BarcelonaTech

Bernat Joseph-Duran, Cetaqua, Water Technology Centre

David Sunyer, Area of Resilience and Climate Change. Aquatec S.L.

Gabriela Cembrano, Institut de Robòtica i Informàtica Industrial (CSIC-UPC)

Jordi Meseguer, Cetaqua, Water Technology Centre

Vicenç Puig, Supervision, Safety and Automatic Control Research Center (CS2AC) - UPC

Alejandro Carrasco, Development Innovation Area. Canal de Isabel II

10:45–11:00 — WeA.Po2

A review and methodological proposal for resilience assessment in urban drainage networks

Viviana Chala, Universidad de los Andes

Francisco Rivero, Universidad de los Andes

Sarai Díaz, Universidad de Castilla-La Mancha

Pedro L. Iglesias-Rey, Universidad Politécnica de Valencia

Juan Saldarriaga, Universidad de los Andes

11:00–11:15 — WeA.Po3

Effects of Hydraulic Constraints on the Cost of Optimal Sewers Network Designs

Julián Diaz, Universidad de los Andes

Francisco Rivero, Universidad de los Andes

Diego Higuera, Universidad de los Andes

Viviana Chala, Universidad de los Andes

Juan Saldarriaga, Universidad de los Andes

11:15–11:30 — WeA.Po4

Synthetic Data Generation for Wastewater Digital Twin Calibration Using SUMO and Machine Learning

Sara Mota, University of Aveiro

António Andrade-Campos, University of Aveiro

Ana Luísa Reis, University of Aveiro

Ramon Vilanova, Universitat Autònoma de Barcelona

11:30–11:45 — WeA.Po5

Embedding Overflow Structures into Cost-Based Hydraulic Optimization of Urban Drainage Networks within the UTOPIA Framework

Brayan Coy, Universidad de los Andes

Gabriela Bermúdez, Universidad de los Andes

Laura Gutiérrez, Universidad de los Andes

Juan Saldarriaga, Universidad de los Andes

11:45–12:00 **WeA.Po6**

Towards Fast Flood Modelling Using Differentiable Cellular Automata

Srijan Kumar Jha, Delft University of Technology

Riccardo Taormina (online), Delft University of Technology

Dragan Savić, KWR Water Research Institute

12:00–12:15 **WeA.Po7**

A Net Zero Water model for urban communities: Assessing water availability for urban greening

Jacob Ayars, University of Arizona

Dominic L. Boccelli, University of Arizona

Courtney Crosson, University of Arizona

Kevin Lansey, University of Arizona

WeA.Ar - Trustworthy Artificial Intelligence in Water Systems I — G6

Special Session

Date: Wednesday, 20 May 2026 **Time:** 10:30–12:30 **Room:** Artemis

Chair: Bruno Brentan (Federal University of Minas Gerais)

Co-chair: Robert Sitzenfrei (University of Innsbruck), Manuel Herrera (Newcastle University), Martin Oberascher (University of Innsbruck), Andrea Menapace (Eurac Research)

10:30–10:45 **WeA.Ar1**

Development of Best Practice Guidelines for Machine Learning Applications in Urban Water Infrastructure to Avoid Common Pitfalls

Martin Oberascher, University of Innsbruck

Bruno Brentan, Federal University of Minas Gerais (UFMG)

Andrea Menapace, Eurac Research

Manuel Herrera, Newcastle University

Guangtao Fu, University of Exeter

Riccardo Taormina (online), Delft University of Technology

Robert Sitzenfrei, University of Innsbruck

10:45–11:00 **WeA.Ar2**

Explainable Artificial Intelligence for Leakage Localisation in Water Distribution Networks

Ines Mastouri, University of Innsbruck

Mohammad Rajabi, University of Innsbruck

Martin Oberascher, University of Innsbruck

Lilia Rejeb, University of tunis, ISG Tunis - SMART Lab

Robert Sitzenfrei, University of Innsbruck

11:00–11:15 **WeA.Ar3**

Beyond the Graph: An Introduction to Simplicial Complexes for Modelling Urban Water Systems

Tetiana Starovoit, National Technical University of Ukraine

Manuel Herrera, Newcastle University

Carlo Giudicianni (online), Università degli Studi di Pavia

Enrico Creaco, Università degli Studi di Pavia

11:15–11:30 **WeA.Ar4**

A Modular Agentic AI Framework for Hydraulic Modelling and Event Management in Water Distribution Systems

Tyler Trimble, The University of Texas at Austin

Yifan Huang, The University of Texas at Austin

Gerardo Riaño-Briceño, Clique Systems

Lina Sela, The University of Texas at Austin

11:30–11:45 **WeA.Ar5**

When Sensors Fail: Exploring Data Imputation and Model Resilience in Physics-Informed Digital Twins of Water Networks

Jordana Alaggio, Federal University of Minas Gerais (UFMG)

Andrea Menapace, Free University of Bozen-Bolzano

Daniel Bezerra, Universidade Federal do Tocantins

Gustavo Meirelles, Federal University of Minas Gerais (UFMG)

Bruno Brentan, Federal University of Minas Gerais (UFMG)

11:45–12:00 **WeA.Ar6**

Statistical and machine learning models with multi-source data for demand prediction in water distribution systems

Maria Fortunato (online), Instituto Superior Técnico

João Caetano (online), Instituto Superior Técnico

Maria Quarta, Instituto Politécnico de Setúbal

Raquel Barreira, Instituto Politécnico de Setúbal

Conceição Amado, Instituto Superior Técnico

Nelson Carriço, Instituto Superior Técnico / Instituto Politécnico de Setúbal

Dídia I.C. Covas (online), Instituto Superior Técnico

12:00–12:15 **WeA.Ar7**

System-Level Transfer Learning from Public Water Demand Datasets

Alessandro Toledo Salazar, California State University

Jorge Pesantez, California State University

Gal Perelman, Technion – Israel Institute of Technology

Avi Ostfeld, Technion – Israel Institute of Technology

12:15–12:30 **WeA.Ar8**

Designing Practical Leakage Detection Software with Water Utilities: a Human-centered Approach

Nikolai-Iraj Sanamrad, Technische Universitaet Berlin

Antoine Daurat, KWB - Kompetenzzentrum Wasser Berlin

Nick Langer, Technische Universitaet Berlin

Sophie Persigehl, Urban Impact Berlin GmbH

Ella Steins, Technische Universitaet Berlin

David Steffelbauer, Indigo Water FlexCo

Jonas Schorr, Urban Impact Berlin GmbH

Andrea Cominola, Technische Universitaet Berlin

WeA.Er - Industrial Session I

G1

Special Session

Date: Wednesday, 20 May 2026 **Time:** 10:30–12:30 **Room:** Ermis

Chair: Orazio Giustolisi (Politecnico di Bari)

Co-chair: Daniele Biagio Laucelli (Politecnico di Bari), Luigi Berardi (Università degli Studi D'Annunzio), Juan Saldarriaga (Universidad de los Andes)

10:30–10:45 WeA.Er1

Data valorisation through WDN geometric model building: the case of Acque Bresciane

Luigi Berardi, Università degli Studi "G. d'Annunzio" Chieti – Pescara

Sonia Bozza, Acque Bresciane S.r.l. SB

Denise Paghera, Acque Bresciane S.r.l. SB

Simone Bardini, Acque Bresciane S.r.l. SB

Filippo Brunati, Acque Bresciane S.r.l. SB

Orazio Giustolisi, IDEA-RT s.r.l.

10:45–11:00 WeA.Er2

Topological domain analysis multi-source water network - Mediterranean

Liberato Bozzelli, Politecnico di Bari

Antonietta Simone, IDEA-RT

Laura Enriquez, Politecnico di Bari

Daniele Biagio Laucelli, Politecnico di Bari

Juan Saldarriaga, Universidad de los Andes

Orazio Giustolisi, Politecnico di Bari / IDEA-RT

11:00–11:15 WeA.Er3

WDNetXL-GIS features to boost the digital transition in WDN management

Laura Enriquez, Politecnico di Bari

Giuseppina Messa, Acquedotto Pugliese S.p.A.

Giulia Acconciaioco, Politecnico di Bari, DICATECh

Lucia Vergine, Acquedotto Pugliese S.p.A.

Giancarlo Chiaia, Consorzio UNING c.s.r.l.

Luigi Berardi, Università degli Studi D'Annunzio, INGEO

Juan Saldarriaga, Universidad de los Andes, CIACUA

11:15–11:30 WeA.Er4

Leakage models: from laboratory scale to water distribution systems

Orazio Giustolisi, Politecnico di Bari

Giulia Acconciaioco, Politecnico di Bari

Antonietta Simone, IDEA-RT s.r.l.

Giuseppina Messa, Politecnico di Bari

Luigi Berardi, Università degli Studi D'Annunzio / Informhydro s.r.l.

Gabriele Freni (online), Università degli Studi di Enna "Kore"

11:30–11:45 WeA.Er5

Enhancing DMA Design throught the AMSI Performance Indicator

Antonietta Simone, IDEA-RT

Liberato Bozzelli, Politecnico di Bari

Simone Ripani, Politecnico di Bari

Daniele Biagio Laucelli, Politecnico di Bari

Orazio Giustolisi, Politecnico di Bari

11:45–12:00 **WeA.Er6**

Efficient pipe replacement plans using Asset Management Support Indicator

Simone Ripani, Università degli Studi "G. d'Annunzio" Chieti – Pescara

Liberato Bozzelli, Politecnico di Bari

Lucia Vergine, Politecnico di Bari

Luigi Berardi, Università degli Studi "G. d'Annunzio" Chieti – Pescara

Daniele Biagio Laucelli, Politecnico di Bari

Juan Saldarriaga, Universidad de los Andes

12:00–12:15 **WeA.Er7**

DMA-Based Pressure Control through Model-Predictive Optimization for Leakage Reduction

Ernesto Arandia, Xylem Inc.

Greg Hendrickson, Xylem Inc.

Masud Rana, Xylem Inc.

James G. Uber, Xylem Inc.

Sam Hatchett (online), Xylem Inc.

Vito Gironda, Xylem Inc.

12:15–12:30 **WeA.Er8**

Exploring the Influence of Drinking Water Violations on Public Health Outcomes: Fixed-Effects Poisson Analysis of Texas Community Water Systems

Gautam Kunwar, The University of Texas at Austin

Corwin Zigler, Brown University

Lina Sela, The University of Texas at Austin

Parallel Session 2

WeB.Ad - Water Systems Operations & Controls II

A5

Regular Session

Date: Wednesday, 20 May 2026 **Time:** 14:00–16:00 **Room:** Adonis

Chair: Lydia Tsiami (KWR Water Research Institute) **Co-chair:** Joeri Willet (KWR Water Research Institute)

14:00–14:15 **WeB.Ad1**

Optimizing Pressurized Irrigation Networks Under Demand Uncertainty

Frederic Babonneau, Kedge BS

Olivier Piller, INRAE

Denis Gilbert, INRAE

Jean-Philippe Vial, University of Geneva

14:15–14:30 **WeB.Ad2**

Advanced Geometric Analysis of Optimally Designed Water Distribution Networks under Increasing Population Density: Insights from Case Studies

Juan Saldarriaga, Universidad de los Andes

Felipe Rodríguez, Universidad de los Andes

14:30–14:45 **WeB.Ad3**

Enhanced NSGA-II with Dynamic Archive and Adaptive Search Strategies for Water Distribution Network Design

Amirabbas Mottahedin, University of Pavia

Carlo Giudicianni (online), University of Pavia

Enrico Creaco, University of Pavia

Maria Cunha, University of Coimbra

14:45–15:00 **WeB.Ad4**

A Citywide Integrated Framework for Optimal Design of Reclaimed Water Distribution Networks

Mohsen Hajibabaei, University of Innsbruck

Robert Sitzenfrei, University of Innsbruck

15:00–15:15 **WeB.Ad5**

A Graph-based Deep Reinforcement Learning Approach for Water Distribution Networks Design

Lydia Tsiami, KWR Water Research Institute

Luca Hermes, Bielefeld University

Alissa Müller, Bielefeld University

Barbara Hammer, Bielefeld University

Christos Makropoulos, National Technical University of Athens

Dragan Savić, KWR Water Research Institute

15:15–15:30 **WeB.Ad6**

Impact of Water Distribution Network Topology on Scenario-Based Water Infrastructure Planning

Chaerin Lee, Korea University

Donghwi Jung, Korea University

15:30–15:45 **WeB.Ad7**

Towards a framework for systematic, optimized design of resilient water allocation and transport infrastructure

Karel Laarhoven, KWR Water Research Institute

Joeri Willet, KWR Water Research Institute

Henk Krajenbrink, KWR Water Research Institute

Maria Lousada-Ferreira, KWR Water Research Institute

Ina Vertommen, KWR Water Research Institute

Peter van Thienen, KWR Water Research Institute

Andrew Segrave, KWR Water Research Institute

15:45–16:00 **WeB.Ad8**

Prediction of Hydraulic Transients and Design of Air Vessels Using Artificial Neural Networks

Debora Móller, Federal University of Minas Gerais (UFMG)

Leandro Evangelista, Federal University of Minas Gerais (UFMG)

Bruno Brentan, Federal University of Minas Gerais (UFMG)

Gustavo Meirelles, Federal University of Minas Gerais (UFMG)

WeB.Ap - Software Tools, Modeling Engines and Platforms I

F1

Regular Session

Date: Wednesday, 20 May 2026 **Time:** 14:00–16:00 **Room:** Apollon

Chair: Elad Salomons (Optiwater, University of Haifa, Israel) **Co-chair:** Sotirios Paraskevopoulos (Centre for Research & Technology Hellas (CERTH))

14:00–14:15 **WeB.Ap1**

EPANET-PLUS: A High-Performance Python Interface for EPANET and EPANET-MSX

André Artelt, Bielefeld University

14:15–14:30 **WeB.Ap2**

A Methodology for Assessing the Functionality of Modelling Packages for Water Distribution Systems

Philippe Beaujean, Société wallonne des eaux

Bogumil Ulanicki, De Montfort University

Juliaan Plancke, SOFTEAU

14:30–14:45 **WeB.Ap3**

Development of a Comprehensive Framework to Compute System Head Curves for Pump Selection in Open and Closed Water Distribution Systems

Diego Paez, Computational Hydraulics Inc. (CHI)

14:45–15:00 **WeB.Ap4**

Real-Time Data Processing and Analysis Platform for Water Supply Systems

Nelson Carriço, Instituto Politécnico de Setúbal / Instituto Superior Técnico / Instituto Superior de Engenharia de Lisboa

Dídia I.C. Covas (online), Instituto Superior Técnico

João Caetano (online), Instituto Superior Técnico

Bruno Ferreira, Instituto Politécnico de Setúbal

Conceição Amado, Instituto Superior Técnico

Raquel Barreira, Instituto Politécnico de Setúbal

Ana Mendes, Instituto Politécnico de Setúbal

Rui Madeira, Instituto Politécnico de Setúbal

Soraia de Almeida, Inframoura E.M.

Helena Ramos, Instituto Superior Técnico

15:00–15:15 **WeB.Ap5**

Building Digital Twins for Small Water Distribution Systems: Application to a Rural Alaskan Community

Yifan Huang, The University of Texas at Austin

Yeji Kim, The University of Texas at Austin

Matt Bartos, The University of Texas at Austin

Lina Sela, The University of Texas at Austin

15:15–15:30 **WeB.Ap6**

An Integrated Monitoring System for Smart Water Networks Enhanced by Digital Twin Modelling

Costas Papadopoulos, University of Cyprus

Marios Kyriakou, University of Cyprus

Stelios Vrachimis, University of Cyprus

Demetrios Eliades, University of Cyprus

15:30–15:45 **WeB.Ap7**

Building Disposable Hydraulic Models from Real Utility GIS: A Lens on How We Use and Think About Models

Sam Hatchett (online), Xylem Inc.

Cameron Devine, Xylem Inc.

James G. Uber, Xylem Inc.

15:45–16:00 **WeB.Ap8**

Agent-Based Modelling of Consumer Behaviour During Drinking Water Contamination Events

Sotirios Paraskevopoulos, Centre for Research & Technology Hellas (CERTH)

Stelios Vrachimis, KIOS Research and Innovation Center of Excellence, University of Cyprus

Marios Kyriakou, KIOS Research and Innovation Center of Excellence, University of Cyprus

Demetrios Eliades, KIOS Research and Innovation Center of Excellence, University of Cyprus

Patrick Smeets, KWR Water Research Institute

Ilias Gialampoukidis, Centre for Research & Technology Hellas (CERTH)

Marios M. Polycarpou, KIOS Research and Innovation Center of Excellence, University of Cyprus

Stefanos Vrochidis, Centre for Research & Technology Hellas (CERTH)

Gertjan Medema, KWR Water Research Institute

WeB.Po - Digital Water Infrastructure & Smart Technologies III

D4

Regular Session

Date: Wednesday, 20 May 2026 **Time:** 14:00–16:00 **Room:** Poseidon

Chair: Avi Ostfeld (Technion – Israel Institute of Technology) **Co-chair:** David Ayala-Cabrera (CWRR-School of Civil Engineering, University College Dublin)

14:00–14:15 WeB.Po1

A Data-Driven Transfer Learning Framework for Sensor Fault Diagnosis in Water Distribution Networks

Jin Li, University of Cyprus

Kleanthis Malialis, University of Cyprus

Xiaohan Chen, University of Cyprus

Marios M. Polycarpou, University of Cyprus

14:15–14:30 WeB.Po2

Towards Data-Efficient Deep Learning for Acoustic Leak Detection in Water Distribution Systems

Yipeng Wu, Tsinghua University

Shuming Liu, Tsinghua University

Zoran Kapelan, Delft University of Technology

14:30–14:45 WeB.Po3

Leak Detection Model for Data-Scarce Water Distribution Systems

Harsh Gupta, Indian Institute of Technology Kanpur

Swati Sirsant, Nirma University, Ahmedabad

Avi Ostfeld, Technion – Israel Institute of Technology

Gopinathan R. Abhijith, Indian Institute of Technology Kanpur

---

14:45–15:00 WeB.Po4

Transferability of a Rupture Localization Method to a Scaled Water Distribution Network (E-NET)

Sabrina Galbo, Politecnico di Milano

Gabriele Dorigo, Politecnico di Milano

Giacomo Ferrarese, Politecnico di Milano

Stefano Malavasi, Politecnico di Milano

15:00–15:15 WeB.Po5

A Transformer-Based Approach to Leakage Detection and Localization in Water Distribution Networks

Charalampos Shimillas, KIOS Research and Innovation Center of Excellence, University of Cyprus

Kleanthis Malialis, KIOS Research and Innovation Center of Excellence, University of Cyprus

Konstantinos Fokianos, University of Cyprus

Marios M. Polycarpou, KIOS Research and Innovation Center of Excellence, University of Cyprus

---

15:15–15:30 WeB.Po6

Water Quality Prediction using LSTM and XAI

Rohit Raphael, Curtin University

Ranjan Sarukkalige, Curtin University

Sridharakumar Narasimhan (online), Indian Institute of Technology Madras

Himanshu Agrawal, Curtin University

15:30–15:45 **WeB.Po7**

Can Generative AI Replace Doctoral Students in Urban Hydraulics?

Pedro L. Iglesias-Rey, Universitat Politécnica de Valencia (Valencia Tech, Spain)

Juan G. Saldarriaga-Valderrama, CIACUA, Universidad de Los Andes

F. Javier Martinez-Solano, Universitat Politécnica de Valencia (Valencia Tech, Spain)

15:45–16:00 **WeB.Po8**

3D Ground-Penetrating Radar Models to Reconstruct the Evolution of Water Leaks in Water Distribution Systems

David Ayala-Cabrera, CWRR-School of Civil Engineering, University College Dublin

Specioza Kimaryo, CWRR-School of Civil Engineering, University College Dublin

---

WeB.Ar - ICT4WATER Cluster: Showcases from selected projects G7

Special Session

Date: Wednesday, 20 May 2026 **Time:** 14:00–16:00 **Room:** Artemis

Chair: Albert S. Chen (University of Exeter) **Co-chair:** Lydia Vamvakeridou-Lyroudia (University of Exeter)

14:00–14:15 **WeB.Ar1**

NBS feasibility and suitability study with MCDA-GIS for the East Fjords of Iceland

Jessica Penny (online), University of Exeter

Anna Berg Samúelsdóttir, MATIS

Gareth Lewis, University of Exeter

Albert S. Chen, University of Exeter

Lydia Vamvakeridou-Lyroudia, University of Exeter / KWR Water Research Institute

---

14:15–14:30 **WeB.Ar2**

A Machine Learning Approach to Modelling Drinking Water Biofilm Thickness

Konstantinos Glynis, KWR Water Research Institute / Delft University of Technology

Mirjam Blokker, KWR Water Research Institute / Delft University of Technology

Zoran Kapelan, TU Delft

Dragan Savić, KWR Water Research Institute / University of Exeter

---

14:30–14:45 **WeB.Ar3**

Reinforcement Learning for optimising the coagulation – flocculation process: A case study at Nieuwegein water pre-treatment plant

Grigorios Kyritsakas, Delft University of Technology

Alex van der Helm, Waternet

Bas Jacobs, Waternet

Luuk Rietveld, Delft University of Technology

14:45–15:00 **WeB.Ar4**

Flexible Small-Scale Drinking Water Treatment Plant Design and Optimisation Tool

Dirk Vries, KWR Water Research Institute

Grigorios Kyritsakas, Delft University of Technology

Nikolaos Pelekanos, National Technical University of Athens

Tavishi Guleria, KWR Water Research Institute

Panagiotis Kossieris, National Technical University of Athens

Iosif Spartalis, National Technical University of Athens

George Bariamis, National Technical University of Athens

Christos Makropoulos, National Technical University of Athens

Luuk Rietveld, Delft University of Technology

Lydia Vamvakeridou-Lyroudia, KWR Water Research Institute

15:00–15:15 **WeB.Ar5**

Democratizing Cross-Project Knowledge for Transforming Water Governance and Climate Resilience: an Agentic AI Ecosystem

Edgar Rubión, Fundació Eurecat

Oriol Alàs, Fundació Eurecat

Ian Palacin, Fundació Eurecat

Iván Cester, Fundació Eurecat

15:15–15:30 **WeB.Ar6**

Leveraging Open Standards for Interoperable Water Resource Management: Showcasing MARCLAIMED's Integrated Decision Support Tool, and its cross-project applicability via the MARVIS virtual sensing tool

Franck Le Gall, Easy Global Market

Luc Gasser, Easy Global Market

Julien Fleury, Easy Global Market

Lupicinio Garcia Ortiz, Cetaqua, Water Technology Centre

Sara Espinosa, Cetaqua, Water Technology Centre

15:30–15:45 **WeB.Ar7**

Dynamic Risk Management for Smart Water Systems

Elena Koumaki, Department of Civil and Environmental Engineering, Imperial College London

Kyriakos Kandris, Department of Civil and Environmental Engineering, Imperial College London

George Milis, PHOEBE Research and Innovation Ltd

Joep van den Broeke, KWR Water Research Institute

Franck Le Gall, Easy Global Market

Demetrios Eliades, KIOS Research and Innovation Center of Excellence, University of Cyprus

Evina Katsou, Department of Civil and Environmental Engineering, Imperial College London

---

15:45–16:00 **WeB.Ar8**

Network-Wide State Reconstruction for Urban Drainage Systems from Sparse Sensor Coverage

Imane El Ghabi, University of Amsterdam

Revin Naufal Alief, University of Groningen

Dilek Düştegör, University of Groningen

Guy Henckens, Aveco de Bondt

Alexander Lazovik, University of Groningen

Victoria Degeler, University of Amsterdam

WeB.Er - Industrial Session II

G2

Special Session

Date: Wednesday, 20 May 2026 **Time:** 14:00–16:00 **Room:** Ermis

Chair: Orazio Giustolisi (Politecnico di Bari)

Co-chair: Daniele Biagio Laucelli (Politecnico di Bari), Luigi Berardi (Università degli Studi D'Annunzio), Juan Saldarriaga (Universidad de los Andes)

14:00–14:15 WeB.Er1

Two-Phase Leakage Detection Strategy Supported by DMAs: application to Valguarnera WDN

Giulia Acconciaioco, Politecnico di Bari

Giuseppina Messa, Politecnico di Bari

Simone Ripani, Politecnico di Bari

Antonietta Simone, IDEA-RT

Luigi Berardi, Università degli Studi D'Annunzio

Gabriele Freni (online), Università degli Studi di Enna "Kore"

14:15–14:30 WeB.Er2

Assessment of water distribution network reliability through an innovative performance indicator and advanced hydraulic analysis

Giuseppina Messa, Politecnico di Bari

Liberato Bozzelli, Politecnico di Bari

Giulia Acconciaioco, Politecnico di Bari

Simone Ripani, Politecnico di Bari

Luigi Berardi, Università degli Studi D'Annunzio

14:30–14:45 WeB.Er3

Work Planning Strategy for Pipe Replacement through Digital Water Services

Giuseppina Messa, Politecnico di Bari

Giulia Acconciaioco, Politecnico di Bari

Laura Enriquez, Politecnico di Bari

Giancarlo Chiaia, Consorzio UNING c.s.r.l.

Gennaro Ranieri, Consorzio UNING c.s.r.l.

Orazio Giustolisi, Politecnico di Bari

14:45–15:00 WeB.Er4

Impact of DMA Design on water quality in Water Distribution Networks

Antonietta Simone, IDEA-RT

Simone Ripani, Politecnico di Bari

Lucia Vergine, Politecnico di Bari

Liberato Bozzelli, Politecnico di Bari

Orazio Giustolisi, Politecnico di Bari

15:00–15:15 WeB.Er5

Water Quality versus Asset Management

Lucia Vergine, Politecnico di Bari / Acquedotto Pugliese S.p.A.

Laura Enriquez, Politecnico di Bari

Giuseppina Messa, Politecnico di Bari / Acquedotto Pugliese S.p.A.

Daniele Biagio Laucelli, Politecnico di Bari

Juan Saldarriaga, Universidad de los Andes

Orazio Giustolisi, Politecnico di Bari / IDEA-RT

15:15–15:30 **WeB.Er6**

Analysis of the impact of asset management on water quality in drinking water networks

Daniele Biagio Laucelli, Politecnico di Bari

Lucia Vergine, Acquedotto Pugliese S.p.A.

Laura Enriquez, Politecnico di Bari

Gabriele Freni (online), Università degli Studi di Enna "Kore"

Orazio Giustolisi, IDEA Research Transfer

15:30–15:45 **WeB.Er7**

Nationwide Patterns of Water Service Line Failures: Insights from 20 Years of U.S. Data

Juneseok Lee, Manhattan University

15:45–16:00 **WeB.Er8**

Digital tools and innovative cooperation models to increase the resilience of drinking water distribution systems

Thomas Bernard, Fraunhofer Institute of Optronics, System Technologies and Image Exploitation

Jochen Deuerlein, 3S Consult GmbH

Armin Canzler, COS Geoinformatik GmbH & Co. KG

Andreas Korth, DVGW Technologiezentrum Wasser

Martin Sigle, Zweckverband Bodensee-Wasserversorgung

Andreas Wunsch, Fraunhofer Institute of Optronics, System Technologies and Image Exploitation

Tobias Martin, DVGW Technologiezentrum Wasser

Martin Wagner, DVGW Technologiezentrum Wasser

Thursday, 21 May 2026

Parallel Session 1

ThA.Ad - Water Systems Resilience **A7**
Regular Session

Date: Thursday, 21 May 2026 **Time:** 10:30–12:30 **Room:** Adonis
Chair: André Artelt (Bielefeld University) **Co-chair:** Dominic L. Boccelli (University of Arizona)

10:30–10:45 **ThA.Ad1**

Evaluating the Operational Resilience of Water Distribution Systems Under Cyberattacks

Tyler Trimble, The University of Texas at Austin

Lina Sela, The University of Texas at Austin

10:45–11:00 **ThA.Ad2**

Hydraulic–Quality Coupled DMA Creation Using Graph Clustering and Particle Swarm Optimization

Daniel Bezerra, Federal University of Tocantins

Jordana Alaggio, Federal University of Minas Gerais (UFMG)

Gustavo Meirelles, Federal University of Minas Gerais (UFMG)

Bruno Brentan, Federal University of Minas Gerais (UFMG)

11:00–11:15 **ThA.Ad3**

Interval Estimation in Water Distribution Systems using Physics-Informed Graph Neural Networks.

Inaam Ashraf, Bielefeld University

André Artelt, Bielefeld University

Barbara Hammer, Bielefeld University

11:15–11:30 **ThA.Ad4**

Spatiotemporal Analysis of Low-Turbidity Data to Assess Drinking Water Distribution System Performance

Roman Tijsseling, The University of Sheffield

Stewart Husband, The University of Sheffield

Joby Boxall, The University of Sheffield

11:30–11:45 **ThA.Ad5**

ARMA Models for Monitoring and Adaptive Control of Water Distribution Systems

Kevin Logan, Technische Universität Darmstadt

Steffen Koppai, Technische Universität Darmstadt

Peter Pelz, Technische Universität Darmstadt

11:45–12:00 **ThA.Ad6**

Temporal Placement of Confirmatory Sampling Locations During a Contamination Event

Camilo Salcedo, California Institute for Water Resources

Dominic L. Boccelli, University of Arizona

12:00–12:15 **ThA.Ad7**

Predicting Chlorine Evolution in Water Distribution Networks Using an Extended GNN-GRU Surrogate Model with Operational Dynamics

Laura Gonzalez, Universidad de los Andes

Yesid Coy, Universidad de los Andes

Dominic L. Boccelli, University of Arizona

Zoran Kapelan, Delft University of Technology

Juan Saldarriaga, Universidad de los Andes

ThA.Ap - Interconnected Water-Energy Systems II

G4

Special Session

Date: Thursday, 21 May 2026 **Time:** 10:30–12:30 **Room:** Apollon

Chair: Lina Sela (The University of Texas at Austin)

Co-chair: Faegheh Moazeni (Lehigh University), Mathaios Panteli (KIOS Research and Innovation Center of Excellence and Department of Electrical and Computer Engineering, University of Cyprus)

10:30–10:45 ThA.Ap1

Model Predictive Control for Reliable Demand Response Participation in Water Distribution Systems

Adhithyan Sakthivelu, The University of Texas at Austin

Lina Sela, The University of Texas at Austin

10:45–11:00 ThA.Ap2

Energy Efficiency Practices in Water Supply and Distribution: A Decade of Research (2015–2025)

Abiyyu Muhammad Irfan, Politecnico di Milano

Alessandra Neri, Politecnico di Milano

Aly-Joy Ulusoy (online), Imperial College London

11:00–11:15 ThA.Ap3

Sewer Heat Recovery Model for Heat Network Planning

Alemtsehay Seyoum, The University of Sheffield

Mohamed Abdel-Aal, University of Exeter

Simon Tait, The University of Sheffield

David Singerton, Anglian Water

Jonathan Bampfield-Duggan, BMA (Business Modelling Applications)

Peter Dunlop, Anglian Water

Stefano Giacalone, BMA (Business Modelling Applications)

Kamalakar Reddy, BMA (Business Modelling Applications)

Alma Schellart, The University of Sheffield

11:15–11:30 ThA.Ap4

Resilience Assessment of Interdependent Water-Power Systems to Weather-Induced Outages

Javad Najafi, KIOS Research and Innovation Center of Excellence and Department of Electrical and Computer Engineering, University of Cyprus

Demetrios Eliades, KIOS Research and Innovation Center of Excellence and Department of Electrical and Computer Engineering, University of Cyprus

Mathaios Panteli, KIOS Research and Innovation Center of Excellence and Department of Electrical and Computer Engineering, University of Cyprus

---

11:30–11:45 ThA.Ap5

Science-driven, human-centric pathways for urban water security

Ebun Akinsete, Athens University of Economics and Business

Angelos Alamanos, Independent Researcher

Sofia Fratzi, Athens University of Economics and Business

Sotiris Georganas, London School of Economics and Political Science

Conrad Landis, Athens University of Economics and Business

Anastasia Litina, Department of Economics, University of Macedonia

Lydia Papadaki, Athens University of Economics and Business

Alina Velias, Athens University of Economics and Business

Phoebe Koundouri, Athens University of Economics and Business

---

11:45–12:00 **ThA.Ap6**

Water to Energy for Heating and Cooling Networks: an Assessment Framework to Support Urban Decarbonisation

Andrea Menapace, Eurac Research

Daniele Anania, Eurac Research / Politecnico di Torino

Marco Cozzini, Eurac Research

12:00–12:15 **ThA.Ap7**

Coordinated State Estimation and Control of Water and Power Systems via Nonlinear Moving Horizon Estimation and Predictive Control

Saskia Putri, Lehigh University

Daniela Vilacres, Lehigh University

Javad Khazaei, Lehigh University

Faegheh Moazeni (online), Lehigh University

12:15–12:30 **ThA.Ap8**

Predictive Control for Coupled Water–Energy Management in AI Data Centers

Saskia Putri, Lehigh University

Javad Khazaei, Lehigh University

Xiaofan Wu, Lehigh University

Faegheh Moazeni (online), Lehigh University

ThA.Po - Climate Resilience & Sustainability

E1

Regular Session

Date: Thursday, 21 May 2026 **Time:** 10:30–12:30 **Room:** Poseidon

Chair: Panagiotis Kossieris (National Technical University of Athens) **Co-chair:** Beatriz Gutierrez Caloir (KWR Water Research Institute)

10:30–10:45 **ThA.Po1**

The Environmental Burden and Disparities of Urban Water Supply Systems in England and Wales

Jiarui Xi, University of Exeter

Xiaoyu Yan, University of Exeter

Guangtao Fu, University of Exeter

10:45–11:00 **ThA.Po2**

Do Cool Islands Safeguard Drinking Water? Insights From a Montreal Case Study

Ludovica Palma, Polytechnique Montréal

Catalina Ortiz, Polytechnique Montréal

Fatemeh Hatam, Polytechnique Montréal

Armando Di Nardo, Università della Campania "Luigi Vanvitelli"

Michèle Prévost, Polytechnique Montréal

11:00–11:15 **ThA.Po3**

Mitigating Climate Change–Driven Temperature Rise in Water Distribution Networks Using Pipe Burial Depth

Robert Sitzenfrei, University of Innsbruck

11:15–11:30 **ThA.Po4**

Assessing the Influence of Climatic and Soil Properties on Drinking Water Pipe Failures

Beatriz Gutierrez Caloir, KWR Water Research Institute

Mirjam Blokker, KWR Water Research Institute / Delft University of Technology

Dragan Savić, KWR Water Research Institute / University of Belgrade / University of Exeter

Mat Collins, University of Exeter

Raziyeh Farmani, University of Exeter / University of Belgrade

---

11:30–11:45 **ThA.Po5**

Professional Outlook as Market Indicator: Linking AWWA's State of the Water Industry to Water Sector Financial Performance

Juneseok Lee, Manhattan University

11:45–12:00 **ThA.Po6**

Four Decades of Analysing Changes in NDVI: A Long-Term Remote Sensing Approach to Monitor Trends in Plant Phenology for Urban Water Management

Franziska Kudaya (online), Graz University of Technology

Albert König, Graz University of Technology

Daniela Fuchs-Hanusch (online), Graz University of Technology

---

12:00–12:15 **ThA.Po7**

Evaluation of Water Reuse Strategies in Eastern Attica under Socio-economic and Climate Change

Eleni Bourika, National Technical University of Athens

Dionysios Nikolopoulos, National Technical University of Athens

Christos Makropoulos, National Technical University of Athens

---

12:15–12:30 **ThA.Po8**

A Topology-Driven Approach Applying CNT to Identify Zonal and Pipe-level Drinking Water Distribution System Discolouration Risk

Linda L.S. Alobaidy, The University of Sheffield

Duncan Thorne, South West Water

Joby Boxall, The University of Sheffield

Stewart Husband, The University of Sheffield

ThA.Ar - Digital Water Infrastructure & Smart Technologies IV — D3

Regular Session

Date: Thursday, 21 May 2026 **Time:** 10:30–12:30 **Room:** Artemis

Chair: Olivier Piller (INRAE) **Co-chair:** Jarne van Gemert (Eindhoven University of Technology)

10:30–10:45 **ThA.Ar1**

Sensor placement for real-life water distribution networks ensuring observability under uncertainties

Jarne van Gemert, Eindhoven University of Technology

Valentina Breschi, Eindhoven University of Technology

Claudia Quintiliani, Brabant-Water

Doekle R. Yntema, Wetsus

Karel J. Keesman, Wageningen University

Mircea Lazar, Eindhoven University of Technology

10:45–11:00 **ThA.Ar2**

IoT-Based Acoustic Tool for Sewer Blockage Detection

Thi Hai Duong Ninh (online), Adelaide University

Duc Cong Hiep Nguyen, Adelaide University

Wei Zeng, Adelaide University

Martin Francis Lambert, Adelaide University

Nhu Cuong Do, Adelaide University

11:00–11:15 **ThA.Ar3**

IoT-enabled Monitoring and Control of Water Distribution Network using free-spectrum communication

Sri Hari Prasath Ramprasad, Indian Institute of Technology Madras

Rohit Raphael, Indian Institute of Technology Madras

Harish Babu, Indian Institute of Technology Madras

Srirag Kuriyattil, Indian Institute of Technology Madras

Murali Nagarajan, Indian Institute of Technology Madras

Sridharakumar Narasimhan (online), Indian Institute of Technology Madras

---

11:15–11:30 **ThA.Ar4**

A Kernel Density Estimation Framework for DMA-Level Leakage Detection: A First Application to an Italian Case Study

Chiara Cincotta, University of Bologna

Michele Lombardi, University of Bologna

Antoine Bruneau, University of Bologna

Cristiana Bragalli, University of Bologna

11:30–11:45 **ThA.Ar5**

Real-time Anomaly Detection in Water Distribution Networks

Nelson Carriço, Instituto Politécnico de Setúbal / Instituto Superior Técnico / Instituto Superior de Engenharia de Lisboa

Guilherme Gonçalves, Instituto Superior Técnico

Renato Moura, Instituto Politécnico de Setúbal

Diogo Oliveira, Instituto Politécnico de Setúbal

João Caetano (online), Instituto Superior Técnico

Dídia I.C. Covas (online), Instituto Superior Técnico

11:45–12:00 **ThA.Ar6**

A Sensor-Aware Framework for Contamination Isolation in Urban Water Distribution Networks

Xiaohan Chen, University of Cyprus

Stelios Vrachimis, University of Cyprus

Marios M. Polycarpou, University of Cyprus

12:00–12:15 **ThA.Ar7**

Hyperspectral Imaging and Machine Learning for Enhanced Detection of Water Contaminants

Lucia Perez-Oliva (online), University of Oviedo

Marta Terrados-Cristos, University of Oviedo

Marina Diaz-Piloñeta, University of Oviedo

Cristian Cedillo-Gancedo, University of Oviedo

Javier Garcia-Gonzalez, University of Oviedo

ThA.Er - Battle of the Water Futures I

BWF1

Battle of the Water Futures

Date: Thursday, 21 May 2026 **Time:** 10:30–12:30 **Room:** Ermis

Chair: Dennis Zanutto (KWR Water Research Institute) **Co-chair:** Dragan Savić (KWR Water Research Institute / University of Exeter), Christos Michalopoulos (KWR Water Research Institute / National Technical University of Athens (NTUA)), Valentina Marsili (University of Ferrara), Jasmin Brandt (Bielefeld University)

10:30–11:00 **ThA.Er1**

Battle of the Water Futures Introduction & Competition Overview

Dennis Zanutto, KWR Water Research Institute

11:00–11:15 **ThA.Er2**

Two-Layer, Risk-Calibrated Trigger-Action Planning for Water Distribution Systems Under Deep Uncertainty and Evolving TopologyTwo-Layer, Risk-Calibrated Trigger-Action Planning for Water Distribution Systems Under Deep Uncertainty and Evolving Topology

Zhou Yisu, Zhejiang university

Chunhui Wang, Zhejiang University

Yexing Wang, Zhejiang University

Hongqi Jin, Zhejiang University

Junxin Wu, Zhejiang University

Jingqing Liu, Zhejiang University

11:15–11:30 **ThA.Er3**

Large Language Model-Driven Multi-Agent Framework for National Water Distribution Systems Under Deep Uncertainty

Yipeng Wu, Tsinghua University

Xipeng Yu, Tsinghua University

Xi Wan, Tsinghua University

Xin Luo, Tsinghua University

Binghai Xing, Tsinghua University

Shuming Liu, Tsinghua University

11:30–11:45 **ThA.Er4**

Adaptive Masterplans for Large-scale Water Systems: An Evolutionary Multi-Objective Optimization Approach

Oluwabunmi Iwakin (online), Lehigh University

Nazia Raza, Lehigh University

Faegheh Moazeni (online), Lehigh University

11:45–12:00 **ThA.Er5**

A Theory of Change Framework for Century-Scale Water System Planning Under Deep Uncertainty

Mohammad Rajabi, University of Innsbruck

Andrea Menapace, EURAC

Martin Oberascher, University of Innsbruck

Mohsen Hajibabaei1, University of Innsbruck

Bruno Brentan, Federal University of Minas Gerais

Manuel Herrera, Newcastle University

Gustavo Meirelles, Federal University of Minas Gerais

Robert Sitzenfrei, University of Innsbruck

12:00–12:15 **ThA.Er6**

A Hybrid Multi-Objective Framework for Long-Term Water Infrastructure Planning Under Deep Uncertainty: Integrating Evolutionary Optimization, Robust Decision Making, and Reinforcement Learning

Alejandra Tabares, Universidad de los Andes

Yesid Coy, Universidad de los Andes

Sebastián Diaz, Universidad de los Andes

Luis Tarazona-Torres, Universidad de los Andes

Laura Juliana Gutiérrez, Universidad de los Andes

Rodrigo Hernandex, Universidad de los Andes

Patricia Zea, Universidad de los Andes

Gabriela Bermúdez, Universidad de los Andes

Mariana Plata, Universidad de los Andes

Duban Jiménez, Universidad de los Andes

Thomas Vargas, Universidad de los Andes

Juan Saldarriaga, Universidad de los Andes

Parallel Session 2

ThB.Ad - Water Distribution System Modelling, Transients and Intelligent Analysis — A8

Regular Session

Date: Thursday, 21 May 2026 **Time:** 14:00–16:00 **Room:** Adonis

Chair: Filippo Mazzoni (University of Ferrara)

Co-chair: Christos Michalopoulos (KWR Water Research Institute / National Technical University of Athens (NTUA))

14:00–14:15 — ThB.Ad1

The Critical Role of Water Service Line Characteristics in the Amplification and Damping of User-induced Pressure Waves

Valentina Marsili, University of Ferrara

Debora Falocci, University of Perugia

Caterina Capponi, University of Perugia

Filippo Mazzoni, University of Ferrara

Stefano Alvisi, University of Ferrara

Bruno Brunone, University of Perugia

Silvia Meniconi, University of Perugia

14:15–14:30 — ThB.Ad2

Bridging Steady-State and Transient Modelling: A Graph-Theoretic MKP Approach for Dynamic Simulation in Water Distribution Networks

Yi He, Harbin Institute of Technology

Jinliang Gao, Harbin Institute of Technology

Huizhe Cao, Harbin Institute of Technology

Wenyan Wu, Birmingham City University

Wei Qiu, Harbin Institute of Technology

Shihua Qi, Heilongjiang Institute of Construction Technology

Fangyuan Liu, Heilongjiang Institute of Construction Technology

---

14:30–14:45 — ThB.Ad3

Cognitive Decision Agents for the Management of Water Systems

Christos Michalopoulos, KWR Water Research Institute / National Technical University of Athens (NTUA)

Christos Makropoulos, National Technical University of Athens (NTUA)

Dragan Savić, KWR Water Research Institute / University of Exeter

---

14:45–15:00 — ThB.Ad4

On composed ML architecture for the modelling of complex water supply systems

José Cação, University of Aveiro

Sara Mota, University of Aveiro

António Andrade-Campos, University of Aveiro

Ana Luísa Reis, University of Aveiro

15:00–15:15 — ThB.Ad5

Applying the Elastic Water Column Model with Dynamic Elements to a Physical Test Rig

Kevin Logan, Technische Universität Darmstadt

Michaela Leštáková, Technische Universität Darmstadt

Peter Pelz, Technische Universität Darmstadt

15:15–15:30 **ThB.Ad6**

Characterization of transient mitigation actions applied in water distribution systems

Franco M. Crivello, Water Technology Center

Jordi Meseguer Amela, Water Technology Center

Adria Domingo Domenech, Water Technology Center

Luis Navarro Perez de Ontiveros, Aquatec

15:30–15:45 **ThB.Ad7**

Flowmeter Output Measurements for Rectangular Flow Input Sequences

Luisfilippo Lanza, Hemina spa

Umberto Sanfilippo (online), Politecnico di Milano

ThB.Ap - Trustworthy Artificial Intelligence in Water Systems II — G9

Special Session

Date: Thursday, 21 May 2026 **Time:** 14:00–16:00 **Room:** Apollon

Chair: Bruno Brentan (Federal University of Minas Gerais)

Co-chair: Robert Sitzenfrei (University of Innsbruck), Manuel Herrera (Newcastle University), Martin Oberascher (University of Innsbruck), Andrea Menapace (Eurac Research)

14:00–14:15 **ThB.Ap1**

Towards Trustworthy Water Demand Forecasting: A Graph Signal Processing Approach to Explainable AI

Bruno Brentan, Federal University of Minas Gerais (UFMG)

Andrea Menapace, Eurac Research

Martin Oberascher, University of Innsbruck

Manuel Herrera, Newcastle University

Robert Sitzenfrei, University of Innsbruck

14:15–14:30 **ThB.Ap2**

Physics-Informed Graph Neural Networks for Hydraulic Analysis of Water Distribution Networks

Xi Wan, Tsinghua University

Shuming Liu, Tsinghua University

14:30–14:45 **ThB.Ap3**

Nodal Consumption Calibration by Using Differentiable Surrogate Models of Water Distribution Networks

João Caetano (online), CERIS – Civil Engineering Research and Innovation for Sustainability, Instituto Superior Técnico, University of Lisbon

---

14:45–15:00 **ThB.Ap4**

Detection and localization of leaks in water distribution networks using physics-informed neural networks and residual analysis

Henrique Dantas, University of Campinas (UNICAMP)

Martin Oberascher, University of Innsbruck

Robert Sitzenfrei, University of Innsbruck

José Gilberto Dalfré Filho, University of Campinas (UNICAMP)

Bruno Brentan, Federal University of Minas Gerais (UFMG)

15:00–15:15 **ThB.Ap5**

Implementation of Data Enabled Predictive Control for Optimal Operation of Urban Drainage Systems

Roni Penn, Technion-IIT

Avi Ostfeld, Technion-IIT

15:15–15:30 **ThB.Ap6**

Learning Beyond Calibration: Physics-Informed Neural Networks for Adaptive Hydraulic State Estimation

Andrea Menapace, Eurac Research

Ariele Zanfei, AIaqua S.r.l.

João Caetano (online), Universidade de Lisboa

Dídia I.C. Covas (online), Universidade de Lisboa

Bruno Brentan, Federal University of Minas Gerais (UFMG)

15:30–15:45 **ThB.Ap7**

Rapid CSO Optioneering Using Deep Learning Surrogates and Multi-Objective Optimisation

Sina Hesarkazzazi, Hazen and Sawyer

James Clarke, Hazen and Sawyer

Rafed Ali, Hazen and Sawyer

15:45–16:00 **ThB.Ap8**

Optimized operation of water distribution networks through predictive metamodeling

Leandro Alves, Federal University of Minas Gerais (UFMG)

Gustavo Meirelles, Federal University of Minas Gerais (UFMG)

Bruno Brentan, Federal University of Minas Gerais (UFMG)

ThB.Po - Capacity Building, Training, Governance and Policy — E2

Regular Session

Date: Thursday, 21 May 2026 **Time:** 14:00–16:00 **Room:** Poseidon

Chair: Lydia Vamvakeridou-Lyroudia (University of Exeter) **Co-chair:** Ramon Pérez (Universitat Politècnica de Catalunya)

14:00–14:15 — ThB.Po1

Introducing Hydraulic Models to the Field Staff - Practical Experience

Philippe Beaujean, Société wallonne des eaux

Bogumil Ulanicki, De Montfort University

Juliaan Plancke, SOFTEAU

14:15–14:30 — ThB.Po2

Serious Gaming as Tool for Operator Training and Community Engagement for Minimizing Disinfection By-Product Exposure

Brent Vizanko, University of Kentucky

Adam Shelly, University of Kentucky

Lindell Ormsbee (online), University of Kentucky

14:30–14:45 — ThB.Po3

From behavioural insights to fair water pricing: Living Labs as a Nexus within the Social Impact Assessment Framework

Ebun Akinsete, Athena Research Center

Angelos Alamanos, Independent Researcher

Sofia Fratzi, Athens University of Economics and Business

Sotiris Georganas, London School of Economics and Political Science

Conrad Landis, Athens University of Economics and Business

Anastasia Litina, University of Macedonia

Lydia Papadaki, Athena Research Center

Alina Velias, Athens University of Economics and Business

Phoebe Koundouri, Athens University of Economics and Business

---

14:45–15:00 — ThB.Po4

Comparative Ignorance as an Explanation of Ambiguity Aversion and Ellsberg Choices: A Survey with a New Proposal for Bayesian Training

Konstantinos Georgalos (online), LANCASTER UNIVERSITY MANAGEMENT SCHOOL

Phoebe Koundouri, Athens University of Economics and Business

Panagiotis Samartzis (online), University of Macedonia

Nikitas Pittis, zDepartment of Banking and Financial Management, University of Piraeus,

---

15:00–15:15 — ThB.Po5

Training, research and dissemination in the water sector an essential collaboration between industry and university

Ramon Pérez, Universitat Politècnica de Catalunya

15:15–15:30 — ThB.Po6

HYDRA: A Modular and Customisable Experimental Facility for Developing and Testing Smart Water Technologies

Christos Makropoulos, National Technical University of Athens (NTUA)

Panagiotis Kossieris, National Technical University of Athens Research Committee

Georgios Moraitis, National Technical University of Athens (NTUA)

ThB.Er - Battle of the Water Futures II — BWF2

Battle of the Water Futures

Date: Thursday, 21 May 2026 **Time:** 14:00–16:00 **Room:** Ermis

Chair: Dennis Zanutto (KWR Water Research Institute) **Co-chair:** Lydia Tsiami (KWR Water Research Institute), Filippo Mazzoni (University of Ferrara), André Artelt (Bielefeld University)

14:00–14:15 — ThB.Er1

Dynamic Adaptive Policy Pathways with Multi-Objective Policy Optimization for Long-Term Water Infrastructure Planning Under Deep Uncertainty

Juneseok Lee, Manhattan University

Jonathan Keck, Xylem

14:15–14:30 — ThB.Er2

Role Based Multi Agent Planning for Long Horizon Adaptive Water Utility Decision Making

Jian Wang, University of Exeter

Chenyue Sun, University of Exeter

Guangtao Fu, University of Exeter

14:30–14:45 — ThB.Er3

Heuristic Decomposition and Uncertainty-Aware Optimisation for Sustainable Water Infrastructure Planning

Patrick Martin, University of Stuttgart

Ilja Kröker, University of Stuttgart

Tim Brünnette, University of Stuttgart

Wolfgang Nowak, University of Stuttgart

14:45–15:00 — ThB.Er4

Formulation and Solution of the Battle of the Water Futures Problem: A Mixed-Integer Linear Programming and Financial Stress Testing Approach

Gal Perelman, Technion – Israel Institute of Technology

Aly-Joy Ulusoy (online), Imperial College London

Carlos Jara-Arriagada (online), University of Aysen, Coyhaique

Bernhard Jonathan Sattler, Institute for the Protection of Terrestrial Infrastructures, German Aerospace Center (DLR)

Bradley Jenks, Hydratek & Associates

Daniel Feghali, Imperial College London

15:00–15:15 — ThB.Er5

The BWF: An Integrated Multi-Criteria Framework for Long-Term Resilience in Urban Water System Planning

Elizabeth Pauline Carreno Alvarado, Universidade Federal do Paraná (UFPR)

Gilberto Reynoso Meza, Pontifícia Universidade Católica do Paraná (PUC-PR)

15:15–15:30 — ThB.Er6

Delineating Pathways for Adaptive Staged Design of Water Distribution Systems under Deep Uncertainty

Dionysios Nikolopoulos, National Technical University of Athens

Ioannis Tsoukalas, Democritus University of Thrace

Panagiotis Kossieris, National Technical University of Athens

Georgios Moraitis, National Technical University of Athens

Sotirios Moustakas, National Technical University of Athens

Panagiotis Dimas, National Technical University of Athens

Nikos Pelekanos, National Technical University of Athens

Christos Makropoulos, National Technical University of Athens

---

15:30–15:45 **ThB.Er7**

Battle of the Water Futures: Phased Nationwide Water Grid Planning under Deep Uncertainty

Hani Ghamkhar, The University of Texas at Austin

Yifan Huang, The University of Texas at Austin

Adhithyan Sakthivelu, The University of Texas at Austin

Meghna Thomas, Pacific Northwest National Laboratory

Tyler Trimble, The University of Texas at Austin

Lina Sela, The University of Texas at Austin

15:45–16:00 **ThB.Er8**

Battle of the Water Futures Closing Keynote & Results

Dennis Zanutto, KWR Water Research Institute

Author Index

Paper Index

Code	Paper ID	Session	Title	Page
ThB.Ap6	192	G9	Learning Beyond Calibration: Physics-Informed Neural Networks for Adaptive Hydraulic State Estimation	69
ThB.Ap7	217	G9	Rapid CSO Optioneering Using Deep Learning Surrogates and Multi-Objective Optimisation	69
ThB.Ap8	238	G9	Optimized operation of water distribution networks through predictive metamodeling	69
ThB.Er1	284	BWF2	Dynamic Adaptive Policy Pathways with Multi-Objective Policy Optimization for Long-Term Water Infrastructure Planning Under Deep Uncertainty	71
ThB.Er2	286	BWF2	Role Based Multi Agent Planning for Long Horizon Adaptive Water Utility Decision Making	71
ThB.Er3	293	BWF2	Heuristic Decomposition and Uncertainty-Aware Optimisation for Sustainable Water Infrastructure Planning	71
ThB.Er4	294	BWF2	Formulation and Solution of the Battle of the Water Futures Problem: A Mixed-Integer Linear Programming and Financial Stress Testing Approach	71
ThB.Er5	295	BWF2	The BWF: An Integrated Multi-Criteria Framework for Long-Term Resilience in Urban Water System Planning	71
ThB.Er6	297	BWF2	Delineating Pathways for Adaptive Staged Design of Water Distribution Systems under Deep Uncertainty	71
ThB.Er7	299	BWF2	Battle of the Water Futures: Phased Nationwide Water Grid Planning under Deep Uncertainty	72
ThB.Er8	304	BWF2	Battle of the Water Futures Closing Keynote & Results	72
ThB.Po1	68	E2	Introducing Hydraulic Models to the Field Staff - Practical Experience	70
ThB.Po2	80	E2	Serious Gaming as Tool for Operator Training and Community Engagement for Minimizing Disinfection By-Product Exposure	70
ThB.Po3	169	E2	From behavioural insights to fair water pricing: Living Labs as a Nexus within the Social Impact Assessment Framework	70
ThB.Po4	198	E2	Comparative Ignorance as an Explanation of Ambiguity Aversion and Ellsberg Choices: A Survey with a New Proposal for Bayesian Training	70
ThB.Po5	275	E2	Training, research and dissemination in the water sector an essential collaboration between industry and university	70
ThB.Po6	262	E2	HYDRA: A Modular and Customisable Experimental Facility for Developing and Testing Smart Water Technologies	70
TuA.Ad1	28	A1	Near Real-Time Leak Detection and Localisation Field Results for Small, Medium and Large Water Networks	21
TuA.Ad2	89	A1	Near Real-Time Anomaly Detection and Leak Localisation: Field Test Outcomes from a Large Water Utility in North America	21
TuA.Ad3	102	A1	Real-Time Leak Detection and Localization in Water Distribution Networks via Mahalanobis Space Transformation	21
TuA.Ad4	139	A1	Leak detection in intermittently operated water networks using physics informed machine learning.	21
TuA.Ad5	224	A1	Sensitivity analysis of model-based and data-driven leakage detection algorithms	22
TuA.Ad6	225	A1	A Real-World Benchmark Dataset for Leakage Detection based on Repairs Records	22
TuA.Ad7	257	A1	Data-Driven and Model-Based Approach for Model Calibration and Leak Localization in Water Distribution Systems	22
TuA.Ad8	82	A1	Automating the E-FAVOR Process for Burst Detection - An Industrial Case Study	22

Code	Paper ID	Session	Title	Page
TuB.Ar7	261	F2	Hybrid Multi-Species Reactive Transport Models for Water Quality Predictions in Water Distribution Systems	35
TuB.Ar8	252	F2	EPANET 2.3: Advancing Modelling in Water Distribution Systems Simulations	35
TuB.Po1	34	D2	Development of a DHW system model in Modelica to simulate energy use and legionella growth in German building Stock	32
TuB.Po2	39	D2	Uncovering the Drivers of Greenhouse Gas Emissions in Wastewater Treatment Plants via a Data-Driven Causal Network	32
TuB.Po3	51	D2	In-situ Verification Technique of Electromagnetic Flowmeters in Water Distribution Networks Based on Error Model and Global Sensitivity Analysis	32
TuB.Po4	75	D2	Quasi-transient reduced-order model based on graph decomposition and real-time data assimilation	32
TuB.Po5	97	D2	Data-Driven Thermohydraulic Estimation of Service Pipe Lengths in Water Distribution Networks	32
TuB.Po6	167	D2	Uncertainty-Aware Graph Neural Network Surrogates for Wastewater Digital Twins Using Conformal Prediction	33
TuB.Po7	193	D2	The Relative Impact of Electricity Price and Water Demand Forecast Accuracy on Water Systems Operations	33
TuB.Po8	248	D2	Insights from interpolating pressure transient metrics in water distribution networks	33
TuC.Ad1	8	A3	Analysis of Hot and Cold Water Consumption of Residential Users Using High-resolution Data	36
TuC.Ad2	52	A3	Spatial Resolution of Demand Modelling in Water Distribution Networks	36
TuC.Ad3	58	A3	Minimum Night Consumption in Water Distribution Networks as a Function of Aggregate Average User Outflows	36
TuC.Ad4	107	A3	A Scenario-Based Approach to Forecasting Peak Water Demand	36
TuC.Ad5	172	A3	Recurrent Neural Networks for Short-Term Water Demand Forecasting: A Technical Review and Framework for Implementation	36
TuC.Ad6	175	A3	Predicting WDS Zonal Demands Using Deep Learning	36
TuC.Ad7	191	A3	Probabilistic deep learning for short-term urban water demand forecasting	36
TuC.Ap1	10	B3	Field Investigation on the Effect of Coagulant Carry-Over on the Occurrence of Metals in the City of Calgary DWDS	37
TuC.Ap2	21	B3	Innovative Nanobubble Solutions for Microplastic-Biofilm Management in Drinking Water Distribution Systems	37
TuC.Ap3	55	B3	Data-driven Approaches for Understanding and Improving Mixing in Service Reservoirs	37
TuC.Ap4	56	B3	Exploring the Transferability of Empirical Discolouration Modelling in Trunk Mains	37
TuC.Ap5	121	B3	Assessment of Innovative Approaches to Service Reservoir Ingress Monitoring	37
TuC.Ap6	218	B3	The Heat Strikes Back: Natural Convection Upstream of a Hot Water Heater	37
TuC.Ap7	235	B3	Risk Assessment of Water Reservoir Systems via Monte Carlo Forecasting	38
TuC.Ap8	285	B3	Self-Cleaning in DWDS under Variable Demand Patterns and Particle Densities	38
TuC.Ar1	125	G8	Recommendations for updating EU level directives of water policy and governance.	40

Code	Paper ID	Session	Title	Page
TuC.Ar2	268	G8	Bridging Land and Sea through Digital Twins for Inland Waters: Reference Architecture and Synergies with EDITO and DestinE	40
TuC.Ar3	269	G8	Engagement of stakeholders in the Digital Twin era: insights and experience from Water-Oriented Living Labs	40
TuC.Ar4	271	G8	Co-Creation of Reference Use Cases in IDEATION: A Stakeholder-Driven Foundation for Inland Water Digital Twins	40
TuC.Ar5	272	G8	A Methodological Framework for the Technological Core Assessment of Digital Twin Systems in Inland Waters: A Use Case of Lake Vico	40
TuC.Ar6	273	G8	Leveraging Large Language Models for Requirements Mapping in Digital Twin Architectures for Inland Waters	41
TuC.Ar7	274	G8	Multi AI Agent Orchestration for Cyber-Physical Security of Drinking Water Systems	41
TuC.Ar8	281	G8	OpenKIWAS: Open Knowledge Inventory for Inland Water Systems	41
TuC.Po1	5	C1	Defect-Level Analysis of Sewer Pipes in Auckland's Urban Drainage System	38
TuC.Po2	6	C1	Smart Sewer Sensors and Field Responses: Operational Evidence Through Blockage and Spill Records from a Regional Sewer Network in Australia	38
TuC.Po3	23	C1	Factors influencing 28 types of defects in sewer systems	38
TuC.Po4	101	C1	Sensor Placement in Urban Drainage Networks for Pipe Blockage Detection	38
TuC.Po5	103	C1	Early Detection of Blockages in Urban Sewer Networks	39
TuC.Po6	116	C1	Efficient fine-tuning of Vision–Language Models for Sewer Defect Detection	39
TuC.Po7	171	C1	Event-based Smart CSO Monitoring Framework and Optimal Sensor Selection Using SWMM and Genetic Algorithm	39
TuC.Po8	194	C1	Brown Objects in Water: Computer Vision Analysis of Gross Solids Transport in Sewer Pipes	39
WeA.Ad1	40	A4	Scaling DeePC With Genetic Algorithm Driven PRV Placement in Water Networks: From Exhaustive Search To Optimization	42
WeA.Ad2	45	A4	Pressure control optimization of real-word water distribution network in a multicriteria decision-making framework	42
WeA.Ad3	46	A4	Dynamic Modeling and Constrained Feedback Control in Water Distribution Networks: Case Study in a Peripheral Region of a Large Brazilian City	42
WeA.Ad4	81	A4	A Unified Framework for Remote Pressure Control: From Existence and Uniqueness to Cooperative Strategies	42
WeA.Ad5	105	A4	Data-Driven Robust Optimization of PRV Operation in Water Distribution Systems under Demand Uncertainty	42
WeA.Ad6	142	A4	Voice-Automated, Data-Driven Optimization Framework for Equitable Supply in Water Distribution Networks	42
WeA.Ad7	202	A4	Optimal Pump Scheduling in WDNs: Assessing Tank Dynamics Discretisation via Direct Multiple Shooting	43
WeA.Ad8	264	A4	On the use of numerical models to analyze pressurized irrigation systems through performance indicators	43
WeA.Ap1	54	G5	A Hybrid Digital Twin for Enhanced Water Treatment: Integrating Physics-Based Models, Machine Learning, and Explainable AI in Industrial Use Cases	44
WeA.Ap2	78	G5	Towards an AI-based EPANET-MSX Surrogate Model	44
WeA.Ap3	93	G5	Uncertainty-Aware Short-Term Forecasting of Water Demand Using Data-Driven Models and Conformal Prediction	44

Code	Paper ID	Session	Title	Page
WeB.Ar8	185	G7	Network-Wide State Reconstruction for Urban Drainage Systems from Sparse Sensor Coverage	56
WeB.Er1	16	G2	Two-Phase Leakage Detection Strategy Supported by DMAs: application to Valguarnera WDN	57
WeB.Er2	15	G2	Assessment of water distribution network reliability through an innovative performance indicator and advanced hydraulic analysis	57
WeB.Er3	22	G2	Work Planning Strategy for Pipe Replacement through Digital Water Services	57
WeB.Er4	18	G2	Impact of DMA Design on water quality in Water Distribution Networks	57
WeB.Er5	26	G2	Water Quality versus Asset Management	57
WeB.Er6	24	G2	Analysis of the impact of asset management on water quality in drinking water networks	58
WeB.Er7	70	G2	Nationwide Patterns of Water Service Line Failures: Insights from 20 Years of U.S. Data	58
WeB.Er8	73	G2	Digital tools and innovative cooperation models to increase the resilience of drinking water distribution systems	58
WeB.Po1	77	D4	A Data-Driven Transfer Learning Framework for Sensor Fault Diagnosis in Water Distribution Networks	54
WeB.Po2	91	D4	Towards Data-Efficient Deep Learning for Acoustic Leak Detection in Water Distribution Systems	54
WeB.Po3	154	D4	Leak Detection Model for Data-Scarce Water Distribution Systems	54
WeB.Po4	178	D4	Transferability of a Rupture Localization Method to a Scaled Water Distribution Network (E-NET)	54
WeB.Po5	214	D4	A Transformer-Based Approach to Leakage Detection and Localization in Water Distribution Networks	54
WeB.Po6	231	D4	Water Quality Prediction using LSTM and XAI	54
WeB.Po7	263	D4	Can Generative AI Replace Doctoral Students in Urban Hydraulics?	54
WeB.Po8	265	D4	3D Ground-Penetrating Radar Models to Reconstruct the Evolution of Water Leaks in Water Distribution Systems	55