OCTOBER 10-12, 2023 - TIMISOARA, ROMANIA - CONFERENCE

International Association for Hydro-Environmental Engineering and Research

Politehnica University Timișoara

Romanian Academy - Timișoara Branch

*IAHR International Workshop on Cavitation and Dynamic Problems in Hydraulic Machinery and Systems*

# IAHRWG 2023

# PROGRAM

# DAY 1

TUESDAY, OCTOBER 10, 2023

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|---|---|
| **08:00-10:00** | Welcome & Registration |
| **10:00-11:30** | Opening ceremony & invited lectures (Auditorium)<br>ID37, ID49 |
| **11:30-11:50** | Coffee break |
| **11:50-13:30** | Session 1A (Auditorium)<br>ID19, ID15, ID32, ID46, ID43<br><br>Session 1B (K1 Room)<br>ID41, ID25, ID18, ID16, ID02 |
| **13:30-15:30** | Lunch break |
| **15:30-17:10** | Session 2A (Auditorium)<br>ID47, ID27, ID50, ID54, ID55<br><br>Session 2B (K1 Room)<br>ID20, ID36, ID38, ID03, ID33 |
| **18.30-23.00** | Recas vineyard gala dinner<br>www.cramelerecas.ro |




# TUESDAY, OCTOBER 10, 2023

## 10:50 – 11:30 SESSION OPENING – AUDITORIUM

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|---|---|---|
| ID 37 | Carmen BADINA (NEAGOIE) | Estimating the degradation ratio caused by attached cavitation on NACA0009 hydrofoil |
| ID 49 | Pavel RUDOLF | Hydrodynamic cavitation and cold plasma: innovative approaches for water treatment and disinfection |

## 11:50 – 13:30 SESSION 1A – AUDITORIUM

| | | |
|---|---|---|
| ID 19 | Mathieu METTILLE | Non-viscous flow simulations of six jet Pelton turbines: The effect of jet interference and of erosion on the performance of the runner |
| ID 15 | Stefan FRAAS | Multidisciplinary and parallel optimization of the runner blade of an axial turbine |
| ID 32 | Daniel BINER | Numerical study on pressure fluctuations in a variable speed pump-turbine with head variations |
| ID 46 | Matthieu DREYER | Assessing the mileage reduction of a Kaplan turbine hybridized with a battery using digital twins |
| ID 43 | Christian LANDRY | Assessment of ancillary services contribution of a Kaplan turbine using different advanced technologies |

## 11:50 – 13:30 SESSION 1B – K1 ROOM

| | | |
|---|---|---|
| ID 41 | Sebastian MUNTEAN | Assessment of the cavitational behaviour induced by a symmetrical suction elbow in a centrifugal pump impeller |
| ID 25 | Håkan NILSSON | Numerical simulations of cavitating flows in the U9-400 Kaplan turbine mode |
| ID 18 | Oliver KIRSCHNER | Localization of cavitation areas using beamforming with acoustic emission sensors on a cavitation channel |
| ID 16 | Arthur FAVREL | Identification of full-load cavitation surge onset in hydropower units through monitoring data clustering |
| ID 02 | Ionuț Daniel RUS | Estimating the degradation ratio caused by attached cavitation on NACA0009 hydrofoil |

TUESDAY, OCTOBER 10, 2023

## 15:30 – 17:10 SESSION 2A – AUDITORIUM

| | | |
|---|---|---|
| ID 47 | Sebastian Denis CHIRKOV | Realizable velocity profiles downstream Francis runner for reduction of part load pressure pulsations |
| ID 27 | Dadi Ram DAHAL | Effect of runner blade numbers on inter blade vortices of Francis turbine under best efficiency loading |
| ID 50 | Pavel RUDOLF | Shape optimization of hydraulic turbine diffuser under swirling flow conditions to mitigate vortex rope instability |
| ID 54 | Tiberiu CIOCAN | Cavitation-free hydro-kinetic deep-river turbine design and analysis |
| ID 55 | Romeo SUSAN-RESIGA | In-situ updating of the cam surface for a double-regulated bulb turbine |

## 15:30 – 17:10 SESSION 2B – K1 ROOM

| | | |
|---|---|---|
| ID 20 | Håkan NILSSON | Dynamic Mode Decomposition of Rotating Vortex Rope Instability |
| ID 36 | David ŠTEFAN | Influence of swirl ratio on the onset of columnar vortices in the mixing part of swirl generator |
| ID 38 | Alin Ilie BOSIOC | Flat free runner with outer ring for reducing the hydraulic instabilities developed in the discharge cone of a Francis turbine |
| ID 03 | Raul Alexandru SZAKAL | Unsteady pressure field analysis in different configurations of decelerated swirling flow with 90° sharp heel elbow |
| ID 55 | Jens KAHLER | Analysis of Vortex Rope Frequencies in the Draft Tube Cone of Francis-type Turbines |

WEDNESDAY, OCTOBER 11, 2023

# DAY 2

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|---|---|
| **09:00-11:00** | Session 3A (K1 Room)<br>ID04, ID45, ID52, ID06, ID21, ID17 |
| | Session 3B (K2 Room)<br>ID42, ID13, ID14, ID24, ID11, ID07 |
| **11:00-11:20** | Coffee break |
| **11:20-13:00** | Session 4A (K1 Room)<br>ID44, ID35, ID05, ID30, ID31 |
| | Session 4B (K2 Room)<br>ID34, ID48, ID10, ID08, ID12 |
| **13:00-15:00** | Lunch break |
| **15:00-16:00** | Session 5A (K1 Room)<br>ID34, ID48, ID10, ID08, ID12 |
| **16:00-16:20** | Coffee break |
| **16.20-17.00** | Closing ceremony<br>(K1 Room) |

WEDNESAY, OCTOBER 11, 2023

## 09:00 – 11:00 SESSION 3A – K1 ROOM

| | | |
|---|---|---|
| ID 04 | Jonathan NICOLLE | Building a structural digital twin for the transient behaviour of a hydraulic turbine using modal analysis |
| ID 45 | Jeremy SCHMID | Damage prediction of turbine start-up sequence of a full size frequency converter variable speed pump-turbine using transient stress signals |
| ID 52 | Radim BURDA | CFD investigation on the effect of turbulence models on pressure fluctuations in Venturi nozzle |
| ID 06 | Dmytro ROZPUTNIAK | Proper Orthogonal Decomposition of the Unsteady Flow Field in a Butterfly Valve |
| ID 21 | Martina NOBILO | On the flow-induced pulsating forces during load rejection of a Kaplan turbine model |
| ID 17 | Marco ZORN | Investigation of the tailwater flow during hydraulic short circuit operation in the Alqueva II pumped storage power plant |

## 09:00 – 11:00 SESSION 3B – K2 ROOM

| | | |
|---|---|---|
| ID 42 | Sébastien ALLIGNE | FMI Co-simulation 1D-3D SIMSEN-CFX |
| ID 13 | Peter DOERFLER | Upstream influence on the Francis turbine full-load surge Part I: Runner blade cavitation vs. penstock response |
| ID 14 | Peter DOERFLER | Upstream influence on the Francis turbine full-load surge Part II: The role of penstock dynamics |
| ID 24 | Daniel HIMR | Influence of pressure reducing valve on water hammer in drinking water pipeline system |
| ID 11 | Jošt PEKOLJ | Analytical and numerical modelling of trapped air pockets in hydraulic pipeline systems |
| ID 07 | Sorin-Ioan LUPA | Temporal interaction of water hammer factors during the load rejection regimes in a hydropower plant equipped with Francis turbines |

WEDNESAY, OCTOBER 11, 2023

## 11:20 - 13:00 SESSION 4A - K1 ROOM

| | | |
|---|---|---|
| ID 44 | Christophe NICOLET | Analytical approach for Francis turbine part load resonance risk assessment |
| ID 35 | Cristóbal Ibáñez | CFD for added mass and damping effects on a model Kaplan turbine |
| ID 05 | Martin GAGNON | Virtual sensors for indirect strain measurements during Francis turbine startup |
| ID 30 | Raphaël JEAN | Acoustic-structure interaction in disk-disk configurations in water for high head pump-turbines |
| ID 31 | Emilie QUENEDEY | Numerical and Analytical Estimation of the Hydrodynamic Coefficients of a Radial Seal under Whirling Vibrations |

## 11:20 - 13:00 SESSION 4B - K2 ROOM

| | | |
|---|---|---|
| ID 34 | Wilhelm WEBER | Estimation of runner side chamber behavior of Francis turbines for shaft line dynamics |
| ID 48 | Gabriele GAITI | Modal analysis and characterization of a hydrofoil circular cascade test rig for hydrodynamic damping measurements |
| ID 10 | Samer AFARA | Dynamic Stress Prediction during Load Rejections in Hydraulic Turbines |
| ID 08 | Maxime CHIARELLI | Investigation of the natural modes of a Pelton runner prototype |
| ID 12 | Karim KHALFAOUI | Modelling and prediction of the fluid-induced quantities in the context of structural vibrations using the imposed modal motion approach |

## 15:00 - 16:20 SESSION 5A - K1 ROOM

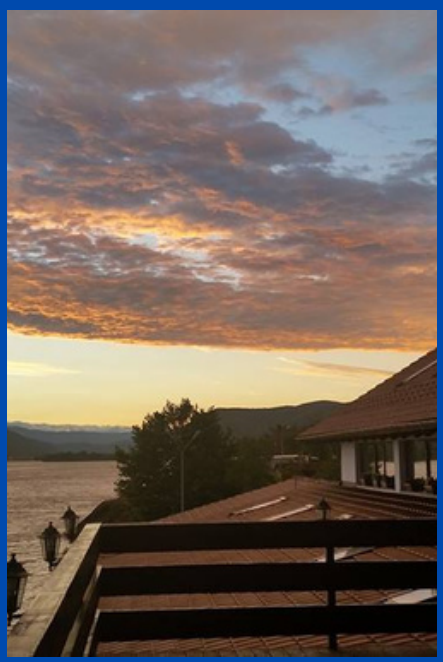
| | | |
|---|---|---|
| ID 22 | Xiao LANG | Machine learning for transient test sequences in closed-loop hydraulic turbine rigs: optimization of pump operation for stable head |
| ID 09 | Jonathan FAHLBECK | On the pump mode shutdown sequence for a model contra-rotating pump-turbine |
| ID 53 | Pavel JANDOUREK | Analysis of inlet recirculation in centrifugal pumps |
| ID 51 | Jiří Bezdíček | Design of hydraulic machine for the energy recovery application in water distribution networks |

# DAY 3

THURSDAY, OCTOBER 12, 2023

**08:00-20:00** Technical visit Iron Gates I HydroPower - Plant & Lunch

www.irongates.ro (Wikipedia)



POLITEHNICA UNIVERSITY TIMISOARA

# ABOUT US

Politehnica University Timisoara (UPT) one of the Romanian schools with tradition is an university of advanced research and education that has gained its national and international recognition thought the ongoing activity of generations of teachers and the exceptional activity of prestigious academics.

The research activity of UPT is carried out through the Research Institute for Renewable Energies - ICER, as well as in the 31 research centers able to carry out research grants in national and international competitions, to generate fundamental research activities and high quality application. These centers are specialized in the field of engineering sciences and not only, aiming at excellence in key multidisciplinary fields of society development, such as: information and communication technology; energy, environment and climate change; advanced production technologies and materials; safety and durability of constructions, etc. The aim is to interconnect these fields with doctoral, postdoctoral, and postgraduate training programs, as well as the transfer of know-how to society.

Most of the research activities carried out in UPT are financed by external sources obtained by participating in national and international calls, respectively by contracts with private companies. This represents a confirmation of the superior quality of the research and also of the prestige and professional deontology of the researchers affiliated to this institution. Politehnica University Timisoara has always been involved and still continues to be involved in a series of projects funded by national programs (funds provided by the Romanian Government through UEFISCDI, ANCSI), international programs (Horizon2020 Framework Program, European Cooperation in scientific and technical research, European Space Agency, Erasmus +, Bilateral Cooperation).

Politehnica University Timisoara has an infrastructure which ensures best conditions for teaching and researching. The excellent spaces and equipment which the university offers are a consequence of the last decade's modernization and investment.

Fully consistent with its mission, with the desire to assert itself internationally, Politehnica University Timisoara is currently developing fruitful collaboration with many universities in Europe, USA, Canada, South America and Asia, resulting in over 190 cooperation agreements concluded directly or under European Union programs.

The university`s campus includes 16 student hostels offering approximately 6500 beds, a student cafeteria, a student medical center and two modern sports centers. The 10 faculties of the university provide education programs to approximately 13,500 students. Within the 25 departments of the university, there are nearly 800 teachers and almost 1000 members of staff working in the auxiliary and administrative departments.

www.research.upt.ro