STREAM PROJECT
Workshop

Hydraulic Modeling and Computational Fluid Dynamics

17/06/2026 @UNIVPM (DIISM, Q160; Room #3)

9:30 – 13:30 CET

Training Workshop
Engineering Modeling • Experimental Hydraulics • CFD Applications

Event registration here:
https://docs.google.com/forms/d/e/1FAIpQLSdEe6Ur6mKCqQZPer2PrFIOjAZxqMDJNNf5CJD8F-2GmJ51GQ/viewform?usp=sharing&ouid=100266083956182164319

STREAM project presentation – 15 min (Dr. Mosè Rossi, Ph.D.)

Modeling Engineering – 1h 45 min

Part 1 – Investigation Techniques (Prof. Matteo Postacchini, Ph.D.)

- Introduction to engineering modelling
- Hydrodynamics, sediment transport, and morphodynamics
- Scaling problems

Part 2 – Experimental Modeling (Dr. Gianluca Zitti, Ph.D.)

- Experiment design and measuring techniques
- Data analysis
- Examples:
  - Hydrokinetic screw turbine power measurements;
  - Velocity field measurement using Particle Image Velocimetry (PIV)

Break – 30 min

CFD for Hydraulic Machines – 1h 45 min

Part 1 – Introduction to Computational Fluid Dynamics (CFD) (Prof. Alessandra Nigro, Ph.D.)

- Approaches to fluid dynamics:
  - Experimental methods
  - Theoretical analysis
  - Numerical simulations (CFD)
- Turbulent flow regime
- Applications of CFD

Part 2 – Pump CFD Modeling (Dr. Mosè Rossi, Ph.D.)

- Rotating/stationary domain setup
- 360° geometry reconstruction from blade passage
- Boundary conditions and pump performance evaluation
- Flow visualization and post-processing

Notice:
The workshop will be conducted either in Italian or in English, depending on the nationalities of the participants. Participants are strongly encouraged to install ANSYS (Fluent and CFX) in advance. The software can be downloaded and installed from the following link: https://www.ansys.com/it-it/academic/students/ansys-student