

# PhD in Civil and Environmental Engineering

## Research Title:

## Hydraulic Engineering

<b>Funded by</b>	Politecnico di Torino
------------------	-----------------------

<b>Thematic area referent</b>	Francesco Laio – referent for Hydraulic Engineering (tutors/advisors will be assigned according to the specific topic)
-------------------------------	--

<b>Contact</b>	francesco.laio@polito.it
----------------	--------------------------

<b>Context of the research activity</b>	<p>The research work includes the application of fluid mechanics, hydrology and hydraulic engineering to address issues affecting the natural and built environment. The research approach will be based on the development of analytical and numerical methods, as well as with the design and execution of lab and field experiments. More in detail, specific issues to be addressed within the PhD include:</p> <ul style="list-style-type: none"><li>• Eco-hydraulics and eco-hydrology</li><li>• Environmental Fluid Mechanics</li><li>• Floods and droughts</li><li>• Fluid Mechanics</li><li>• Hydrological processes under climate change</li><li>• Groundwater</li><li>• Hydraulics, landscape and cultural heritage</li><li>• Hydropower systems and hydraulic complex networks</li><li>• River engineering</li><li>• Statistical hydrology</li><li>• Turbulent flows</li><li>• Water and agriculture</li><li>• Water and food security</li><li>• Water quality and transport processes</li><li>• Water resources management</li></ul>
---	---

<b>Objectives</b>	The general aim is to develop a better understanding of fundamental processes in Fluid Mechanics and Hydrology with a view to develop innovative solutions for problems that are of interest within the field
-------------------	---

	<p>of water engineering.. The application and development of e.g. new tools for experimental data analysis (both in laboratory and in the field), processing algorithms, modelling and interpretation methods as well as patentable technologies are foreseeable objectives of the research work.</p> <p>Publication on peer reviewed international journals are foreseeable (and expected)outcomes of the research work.</p>
--	---

<b>Skills and competencies for the development of the activity</b>	<p>The competencies required for the projects include the basic-science field (physics and math), engineering principles (continuum mechanics, experimental data processing, statistics). Fundamental knowledge related to hydraulics and hydrology is required. Knowledge of Matlab and/or “R” as well as proficiency in numerical modelling are preferred skills.</p>
--	---