

Ilaria Butera – CURRICULUM VITAE

21/07/1992: graduated with honors, master in Hydraulic Civil Engineering, Politecnico of Torino
1993-1996: Ph. D. in Hydraulic Engineering at the Politecnico of Milano, 6 months at the Tel Aviv University.
1996-2001: Post Doc position and research activity at the Politecnico of Milano.
2001: Associate Professor in Hydraulics, Politecnico of Torino.

RESEARCH ACTIVITY

Her research activity deals with different, sometimes interrelated, topics:

- **groundwater** Different research activities deal with groundwater: i) flow and transport phenomena through heterogeneous formations: a stochastic approach is applied to characterize the velocity field and solute movement in order to manage the uncertainty due to the aquifer intrinsic complexity. ii) Spring data analysis in order to detect the vulnerability of springs. iii) non linear analysis of groundwater flow and transport data to detect the relationships not captured by cross-correlation analysis.
- **geostatistics** Geostatistics is applied to environmental variables, for instance rainfall depths, solute concentrations. This research activity is related to mapping spatial sparse data considering all the pieces of information available, preserving the data variability (i.e. avoid smoothing effects). The approach is aimed at a solving problem approach, in view of technical application: mapping extreme rainfall data, concentration at polluted site etc.
- **river levees** The analysis of the dynamics that regulates water levels in levees during flood events is examined. Levees are important to defend the territory from flood events and it is important to understand the hydraulic stress that acts on levees. The subsequent arrival of more floods can be very detrimental to the embankment in reason of the water content behavior in the embankment. The use of synthetic design hydrographs
- **inverse problems** Inverse problems are of different types, accumulated by the fact that some outputs are known and from these outputs the input have to be detected or the response of the system has to be detected. Two approaches, mainly, have been addressed: the geostatistical approach and the Ensemble Kalman filter approach. The problems considered are: identification of pollutant sources and release history in both groundwater flow and in water supply systems; identification on the rainfall-discharges relationship for springs in order to better understand their recharge dynamic in view of their use for drinking water purposes or for bottling mineral water.
- **mini/micro hydro** Developing hydraulic wheels, estimation of mini/micro hydropower potential in both rural area and urban area. This research focuses on the chance of using small drop in rural canals or in ancient canal incorporated into towns to develop source of energy production, compatible with the environment.
- **water in buildings** New approaches for a sustainable use of water in buildings. At this aim the research deals with rain water harvesting. Analysis have been carried out considering the use of rain water harvesting at the scale of the single houses for irrigation purposes or for indoor uses (e.g. flushing the toilets), providing an economic analysis. At the town scale the analysis considered also the re-use of rain water for public services: street washing, park irrigations, with different solutions.

She participated and participates to national research project.

She is Author and Co-Author of more than 60 publications on national and international journals (more details are available at

https://iris.polito.it/cris/rp/rp06488?sort_byall=2&orderall=DESC&open=all#.X6pt3PNKjIU).

She is referee for national and international journals

TEACHING ACTIVITY

She is/was holder of various courses:

- Hydraulics I and Hydraulics II; graduate program in Civil Engineering.
- Fluid Mechanics; graduate program in Mechanical Engineering.
- Groundwater Hydraulics; master degree in Hydraulic Civil Engineering.
- Technical Hydraulics: master degree in Building Engineering
- Green water for sustainable building: master degree in Building Engineering.
- Water in building and urban systems: master's degree in Building Engineering.

She collaborates/has collaborated to various courses:

- Multidisciplinary Project III; graduate program in Civil Engineering.
- Environmental Spatial Analysis: master degree in Environmental Engineering

She taught for different specializing second level masters dealing with different aspects related to water: groundwater problems, forensic issues related to water, water civil usages.

She was tutor of many bachelor degree and master degree dealing with various and numerous topics such as: pressurized water systems and energy recovery; numerical modeling of flows in riverbeds; data analysis of monitoring networks; groundwater flow, etc.

FUNDING

Principal Investigator of various projects dealing with:

- Geostatistical analysis of data from groundwater monitoring;
- Research and experimentation of new water wheels for electric generation systems;
- Urban Hydro Technologies;
- Sewerage System and Micro Hydro Production;
- Irrigation canals and energy production

More details are available at

https://www.swas.polito.it/rubrica/scheda_pers.asp?vis_PROG=S&vis_did=&vis_pub=&vis_cv=&matricola=011297#prog

OTHER ACADEMIC - PROFESSIONAL ACTIVITIES

-Member of the Master School Council - Master School and Permanent Training (Politecnico di Torino) for the period 2013-2019.

-She coordinated the 5th edition of the second level master of the Politecnico di Torino in "Water engineering for drinking, civil and industrial use".

-She has carried out expert activities for courts on the subject of water.

- Since June 2021 she has been president of the Liguria Piedmont and Valle d'Aosta section of the Italian Hydrotechnical Association.

Autorizzo il trattamento dei miei dati ai sensi del D.lgs. 196 del 30 giugno 2003 e ss.mm.ii. .