# International Winter School on Hydrology
**1st Announcement**

## 2019 Edition
## DOCTORAL WINTER SCHOOL on DATA RICH HYDROLOGY

Jointly organized by
Interuniversity Consortium for Hydrology **CINID**
UNESCO World Water Assessment Program **WWAP**
University for Foreigners of Perugia **WARREDOC**

With the patronage of
Hydraulic Italian Group (**GII**) - Italian Hydrological Society (**SII**)

Villa Colombella (Perugia, Italy)      January 28th - February 1st 2019

### Keynote Lecturers
Prof. Rafael L. Bras
Prof. Stefan Hulenbrook

**Invited Lecturers by CINID & WARREDOC** [Fabio Castelli, Roberto Deidda, Salvatore Grimaldi, Salvatore Manfreda, Tommaso Moramarco, Fernando Nardi, Maria Cristina Rulli, …]

### Background and Goals

The past century hydrological sciences developed, among the other Earth Sciences sectors, as a data poor scientific discipline. In the 70's, 80' and 90's hydrologists and water resource management professionals struggled with lack of data, data limitations due to the spatial and temporal scale and significant inaccuracies and data voids in hydrological time series and spatial layers. As a matter of fact, hydrologists developed geospatial and numerical interpolation, extrapolations and models to address water resource and risk management challenges and issues. At the end of the century the situation abruptly changed with the Earth Observation (EO) of the water cycle and land morphology from space. Advanced data processing and distribution systems that were implemented at the beginning of the new century easily and freely provided continuous high resolution topographical and environmental data. This was a turning point for hydrology, with the advent of terrain analysis and spatially distributed models that were finally fed by spatially continuous data on water morphology and hydrologic processes. In less than 20 years, remote sensing and ground monitoring systems have transformed the way hydrologists work with an exponential increase of data temporal, spatial scale and resolution. We now live in a data rich world, with public and private satellites, Lidar, drones and ground radars that provide unlimited opportunities and data to hydrologists for understanding, monitoring, modeling and interpreting watershed physical processes, features and water-human interactions in complex urban ecosystems. Moreover, Internet of Things (IoT), video cams and environmental low cost sensors are now increasingly available providing information not only on natural and urban hydrologic system dynamics, but also on human behavior, risk perception and societal dynamics related to human needs (i.e. water-food-energy nexus), natural disasters and water stress. Citizens are not only just passive users, but they dynamically interact, sending and receiving information in real time, becoming human sensors of the real world. As a result, while hydrology is transforming with "New data", Big Data and Data/Citizen science, it seems that it has become more and more important to make sure that the quest for hyper-resolution global water modeling, does not neglect the importance of proper understanding and representation of hydrological and meteorological processes in complex multi-disciplinary earth science research and projects. General goal of this Winter School is to guide participants in understanding and learning the theory, data, methods and tools by means of lectures and hands on for an extensive and immersive introduction to most recent findings of hydrological sciences. At the end of the School students will catch the opportunities of the "Data Rich Hydrology" era we live in, while learning the importance of understanding the knowledge gaps and scientific advancements related to hydrological process mechanics and evolving watershed features.

### PRACTICAL INFORMATION AND LOGISTICS
The fee to register is **450 Euro**. The fee includes research and training material, accommodation and food for the entire week. To apply please fill up the form available at  http://warredoc.unistrapg.it/en/events/2019-winter-school/ **by january 15th, 2019**. For more info please email fabio.castelli (at) unifi.it and warredoc (at) unistrapg.it