

1st Workshop on Improving the Theoretical Underpinnings of Hydrologic Models



At University Centre of Bertinoro, Italy
25- 27 April 2016 (week after EGU)
Sponsored by EGU

FIRST CIRCULAR (Date 29 Nov 2015)

Workshop Organizers: Bettina Schaefli (EPFL, Switzerland), Stan Schymanski (ETHZ, Switzerland), Beth Jackson (University of Wellington, NZ), Charlie Luce (USFS, USA), and Martyn Clark (NCAR, USA),

Local Organizer: Alberto Montanari (University of Bologna, Italy)

About the workshop: There is currently a plethora of hydrological models that are rooted in a multitude of hydrologic laws and theories. We argue that after several international research initiatives to synthesize hydrologic theory, hydrology now urgently needs new approaches to integrate hydrologic theory into model development and enable systematic hypothesis testing. This event will be the first workshop of a new international grass-roots initiative for more systematic hydrologic model development. It will be the first occasion to discuss in detail the key research questions, prepare the material for review/position papers to document how hydrologic theory can be systematically implemented and tested in hydrological models, and chart a course forward for a theoretically grounded approach to model development, including the possibility to develop community models.

The **key questions** are:

1. What are major theories that should guide hydrologic model development?
2. How can we represent small-scale processes that combine to produce large-scale fluxes (emergent behavior, space-time scaling) in a consistent way?
3. How can we make use of optimality principles (or ecological and landscape evolution principles) to constrain model behavior? Are such principles useful when dealing with anthropogenic interactions?
4. How can we reflect the structure of the landscape in the structure of models?
5. How can we develop a rigorous approach to evaluate and select among competing theories and algorithms in presence of highly uncertain observation data?

Goals and Outcomes: The overall goal of the workshop is to launch the new community initiative on improving the theoretical underpinnings of hydrologic models (which was already presented at [AGU 2015](#)) and to define a path forward to create a vigorous interdisciplinary community of hydrologic modelers and data providers with a passion for a more structured and theoretically grounded approach to model development and testing. We will discuss and plan the next steps, including initiation of various bilateral research projects and a long term strategy for the development and testing of hydrological community models.

Workshop format: the workshop will cover 2.5 days of scientific discussion and is by invitation only, limited to around 30 people. Please let us know **as soon as possible** whether you plan to attend (bettina.schaefli@epfl.ch). For your information, the list of invited participants is available [here](#).

Location: Centro Residenziale Universitario Bertinoro, <http://www.ceub.it/>

Workshop fees: around 330€ (shared double) - 400 € (single room) per person including accommodation and meals (including evening arrival 24 April). **Thanks to the financial support of EGU, we will be able to financially support the participation of young scientists. Please let us know if you would like to benefit from this support.**

Workshop programme:

24. 4. : Evening arrival possible, dinner

25. 4. : Workshop start in the late morning, 1 key note presentation per half day, plenary discussions and work in breakout groups

26. 4. : Workshop start in the morning, 1 key note presentation per half day, plenary discussions and in work breakout groups

27. 4. : Workshop ends at lunch time