



The Abdus Salam  
International Centre for Theoretical Physics



**Water resources in developing countries: Planning and management in a climate change scenario**  
27 April – 8 May 2009

**Miramare-Trieste, Italy**

Lack of water resource availability and limited access to these resources are major problems affecting developing countries. Optimal usage of available resources is further constrained by the absence of infrastructure. Although their aspirations in terms of economic and social growth and present levels of water use development may vary considerably, many developing countries are characterized (at least partially) by a semi-arid climate, creating similar challenges for water resources development. Future climate change will likely create additional difficulties in long-term water resource planning and management.

Both hydrological and climate models can be used as tools in water resource planning and management. Applications include real-time flood warnings, the representation of present-day climate (including extremes), land use change impacts, and climate change projections (for example, alterations to the amount and timing of runoff). The coupling of climate and hydrological models is becoming increasingly sophisticated in representing the hydrological cycle. However, most of these models have been developed and tuned for use over humid regions. In addition, the lack of rainfall and discharge data make calibration and validation of hydrological models extremely difficult. Substantial challenges remain in the interdisciplinary measurement and simulation of meteorological and hydrological processes in semi-arid regions, and progress in these areas is critical for the evaluation of future development scenarios.

This conference will bring together the world's leading experts in hydrology and climate science to provide lectures on the state-of-the-art science on this topic, with the goal of transferring knowledge of hydrological modeling from humid regions to semi-arid regions. We will explore how to use these techniques in developing countries that may be data-sparse environments, and where fast communication using digital data may be hard to obtain.

#### Topics

- \* **Present skill of climate models in semi-arid regions**
- \* **State-of-the-art of hydrological modeling and applications: case studies from humid and arid and semi-arid areas**
- \* **Observational data set resources and alternative methods to improve the quality of available data (e.g., remote sensing techniques)**
- \* **Different modeling approaches and methods to characterize model uncertainties**
- \* **Strengths and weaknesses of alternative modeling approaches**
- \* **Climate change in semi-arid regions: observations and model scenarios**

#### Programme

The one-week conference will be followed by a week of laboratory sessions where participants will learn to use some of the models illustrated during the conference. The goal of these sessions is to provide the participants with enough training in order to use the models in their home institutes.

#### Participation

The conference is open to young researchers and PhD students working in the areas of atmospheric physics and dynamics, climatology and oceanography that are members of the United Nations, UNESCO or IAEA. As it will be conducted in English, participants should have an adequate working knowledge of that language. Although the principal objective of the ICTP is to help research workers from developing countries, through a programme of training activities within a framework of international cooperation, students and post-doctoral scientists from developed countries are also welcome to attend.

Every effort should be made by candidates to secure support. However, limited funds are available for some participants (for accommodation or airfare), who are nationals of, and working in, a developing country, and who are not more than 40 years old. Participants are required to take part in all aspects of this activity for its entire duration. **There is no registration fee.**

#### HOW TO APPLY FOR PARTICIPATION

Candidates should complete and submit the Online Application that can be found at: <http://agenda.ictp.it/smr.php?2029>. Comprehensive instructions will guide you step-by-step on how to fill out and submit the application form. Kindly send all file attachments in Word or Acrobat format.

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#### **ORGANIZERS**

**S. Sorooshian** (University of California, Irvine, U.S.A.)  
**E. Coppola** (ICTP, Trieste, Italy)  
**S. Rauscher** (ICTP, Trieste, Italy)

#### **INVITED SPEAKERS INCLUDE:**

**A. Amani** (UNESCO Cluster Office, Accra, Ghana)  
**I. Bisher** (University of California, Irvine, U.S.A.)  
**T. Dinku\*** (Columbia University, U.S.A.)  
**G.M. Garfin\*** (The University of Arizona, Tucson, U.S.A.)  
**F. Giorgi** (ICTP, Trieste, Italy)  
**S. Hagemann** (Max Plank Institute, Hamburg, Germany)  
**T. Hopson** (National Center for Atmospheric Research, Boulder, U.S.A.)  
**U. Lall** (Columbia University, U.S.A.)  
**A. Lipponen** (UNESCO, Paris, France)  
**F. Pappenberger** (ECMWF, Lancaster, U.K.)  
**M. Todd\*** (University College London, U.K.)  
**C. Vorosmarty\*** (University of New Hampshire, Durham, U.S.A.)  
**H. Wheeler** (Imperial College London, U.K.)

\*tbc

**DEADLINE**  
**for requesting**  
**participation**

**15 January 2009**