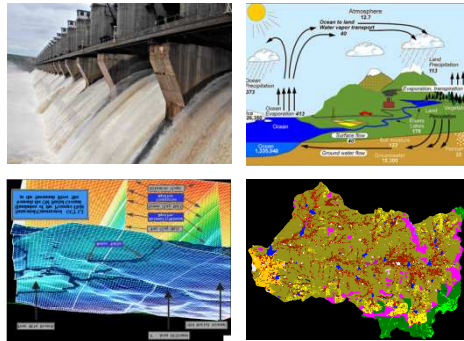


# Winter School

On  
**RESEARCH TOOLS FOR EVALUATING  
AVAILABILITY AND SAFETY OF  
SURFACE WATER AND  
GROUNDWATER**

**DATE: FEBRUARY 6– 10, 2012**



## Hosted by

UTRECHT UNIVERSITY, THE NETHERLANDS  
and  
INDIAN INSTITUTE OF SCIENCE, BANGALORE, INDIA

## Organised by

DEPARTMENT OF CIVIL ENGINEERING, IISc  
&  
KARNATAKA STATE COUNCIL FOR SCIENCE AND  
TECHNOLOGY

## Course coordinators

**S. Majid Hassanizadeh**  
**M S Mohan Kumar**



[www.kscst.org.in](http://www.kscst.org.in)

## WINTER SCHOOL OVERVIEW

Water has a unique place of all the planet's renewable resources. Water is also one of the most manageable of the natural resources as it is capable of diversion, transport, storage, and recycling. The surface water and groundwater resources of the country play a major role in agriculture, hydropower generation, livestock production, industrial activities, forestry, fisheries, navigation, recreational activities.

Water demand already exceeds supply in many parts of the world and as the world population continues to rise, so too does the water demand. India's projected demand is expected to touch 1.5 trillion cubic metres by 2030AD while supply might stay at the current level of 740 billion cubic metres. Climate change and rapid urbanization also could have significant impacts on water resources around the world because of the close connections between the climate, landuse and hydrological cycle, and such changes also could result in cycles of floods and droughts.

It becomes imperative for Researchers to come together and share their experiences and tools and apply their knowledge to address local and regional water challenges.

## LOCATION

The winter school will be held at Indian Institute of Science, Bangalore, the garden city of India. The winter school is scheduled for five days, from 6<sup>th</sup> to 10<sup>th</sup> February 2012.

## WINTER SCHOOL DESCRIPTION

This is a joint programme of IISc and Utrecht University(UU) under their Winter school programme. The target audience for winter school will be young researchers (Senior PhD registrants / post PhD, young faculty members) drawn from different parts of India. This course is meant to stimulate research interests in youngsters in advanced research topics in hydrology and water resources. The course will give a detailed conceptual and mathematical description and numerical modelling of various topics along with field / laboratory experiments, monitoring and analysis

Numerical modelling is becoming an increasingly important tools for analyzing complex problems involving Surface and Groundwater flows. This course is designed to familiarize participants with the principles and mathematical analysis and the application of tools to such problems. The tools used for field experiments as well as laboratory experiments will be presented and discussed in detail.

Since there will be place for only limited participants, there will be selection based on the background of the participant who wants to attend this course. This course is also being supported by Department of Science and Technology, Government of India.

**Registrants are expected to bring their own laptops for hands on exercises with minimum system requirements: Operating Systems: Windows XP / Windows Vista (32 or 64bit) / Windows 7 (32 or 64bit), X86 CPU with 2 GHz, 2 GB RAM, 10 GB total hard disk capacity with about 500 MB reserved for installation, Graphic card with a resolution of 1024 x 768 pixels. No separate computational facility will be provided**

## SESSIONS

The course will cover following topics

- i) Modeling of physical, chemical and biological processes in the vadose zone
- ii) QMRAspot: A tool for quantitative microbial risk assessment from surface water to potable water
- iii) GWPcalc, the groundwater protection calculator: a tool for determining the size of groundwater protection zones
- iv) Remote sensing application in water resources
- v) Climate change and its impact on water resources
- vi) Assimilation of remotely sensed soil moisture into hydrological models
- vii) Coupling crop and groundwater models for optimal groundwater irrigation
- viii) Regionalisation of rainfall
- ix) Regional frequency analysis of floods
- x) Multiphase flows in porous/ fractures media
- xi) Role of delivery systems in quantity and quality control of potable water
- xii) Chemistry and quality of groundwater under geogenic and anthropogenic stress
- xiii) Environmental impact of mining on water quality and remediation strategies
- xiv) Long term monitoring of hydrological and geochemical cycles in the critical zone: case study of small experimental watersheds in the tropics
- xv) Pore network generation for porous media; simulation of flow
- xvi) Pore network modeling of (reactive) transport under (partially-) saturated conditions
- xvii) Principles of mass transfer among phases in the soil
- xviii) Transport of viruses in soil and groundwater

## COURSE PRESENTERS

**Dr Amir Raof** , Researcher, Department of Earth Sciences, Utrecht University, The Netherlands

**Dr S.M.Hassanizadeh**, Professor, Department of Earth Sciences, Utrecht University, The Netherlands

**Dr Jack Schijven**, Expert, National Institute of Public Health and the Environment, (RIVM), The Netherlands

**Dr Jean-Jacques Braun**, Chairman, Indo – French Cell for Water Sciences, IISc

**Dr. Jirka Simunek** , Professor, Department of Environmental Sciences, University of California, Riverside, USA

**Dr M. S. Mohan Kumar** , Professor, Department of Civil Engineering, IISc

**Dr D. Nagesh Kumar**, Professor, Department of Civil Engineering, IISc

**Dr M Sekhar**, Professor, Department of Civil Engineering, IISc

**Dr V.V.Srinivas**, Professor, Department of Civil Engineering, IISc

**Dr S Subramanian**, Professor, Department of Materials Engineering, IISc

**Dr M Sudhakar Rao**, Professor, Department of Civil Engineering, IISc

For any further assistance and / or for sending Registration form please contact

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**Mobile:+91 9845091083**

## REGISTRATION FORM

### RESEARCH TOOLS FOR EVALUATING AVAILABILITY AND SAFETY OF SURFACE WATER AND GROUNDWATER FEBRUARY 6 – 10, 2012

Name\_\_\_\_\_

Position\_\_\_\_\_

Affiliation\_\_\_\_\_

Date of Birth\_\_\_\_\_

Official Address\_\_\_\_\_

City / State\_\_\_\_\_

Pin code\_\_\_\_\_

Phone\_\_\_\_\_

Email\_\_\_\_\_

Date: \_\_\_\_\_ (Signature)

### REGISTRATION

**No registration fee is charged. The interested participants should write about their area of research in 300 words and attach with the filled in registration form. The selection of participants is based on the background of the participant. The course includes, lunch, evening tea / snacks and accommodation**

**Travel cost to the venue has to be borne by the Participant.**

Registration form can also be downloaded at  
[www.kscst.org.in](http://www.kscst.org.in)

**Last date to receive registration form along with write up is 25<sup>th</sup> January 2012**