Gerhard Jirka Summer School on

Environmental Fluid Mechanics from theory to applications

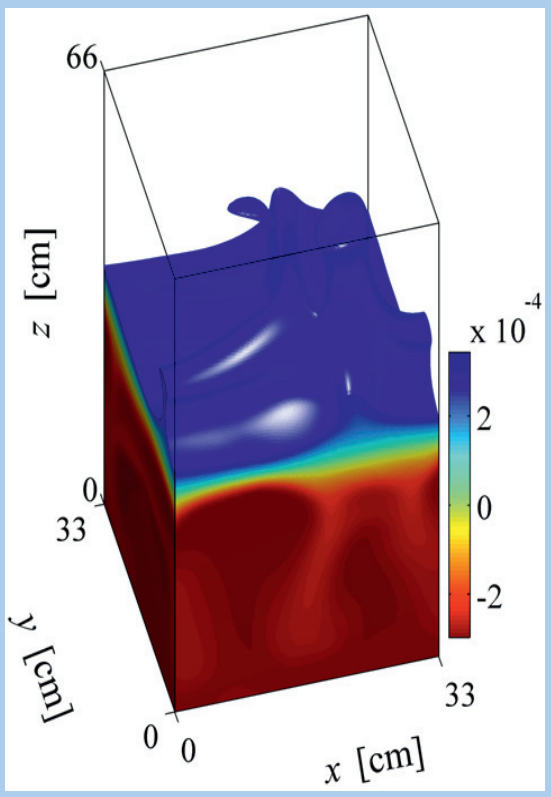
June 11 – 20, 2012, Lucerne School of Engineering and Architecture in Horw, Switzerland

The Eawag Summer School 2012 **Environmental Fluid Mechanics (EFM)** is concerned with the fluid motions and associated mass, heat and momentum transport processes that occur at various scales of the earth's hydrosphere and atmosphere. The interaction of flows and reactions between the natural and built environments is at the centre of EFM.

The School will follow closely the aims and objectives established successfully at the foregoing events held at the Universities of Karlsruhe in 1999 and 2006, Dundee in 2001, Budapest in 2004 and Santiago de Chile in 2009. It will cover the basic theoretical principles underlying a range of environmental flows and their mathematical description.

From theory to applications will be a core element of this edition of the School. Selected computational simulation models and examples of engineering design and environmental applications will be demonstrated. The relation to the environmental concerns will be more intensively highlighted than in former courses.

Student forum In addition to lectures, seminars, and the Saturday field trip to local Alpine waters, the course will have a Student Forum at which students will informally present their current research projects. After a 10-minute presentation related questions can informally be discussed with fellow PhD students and lecturers.



School topics

- Turbulent diffusion and shear flow dispersion of pollution in natural waters and lower atmosphere
- Atmospheric flows, gravity currents, shallow mixing, computational eddy-resolving methods
- Turbulent jets and plumes: entrainment and mixing processes, coastal water quality management
- Rotation effects in environmental flows, boundary currents, Coriolis acceleration, Kelvin waves, Ekman layers, geostrophic flow, coastal fronts
- Stratified flow phenomena, including internal waves and intrusions, Kelvin-Helmholtz / Holmboe instabilities and mixing
- Stratified lakes and reservoirs and related water quality, boundary layer mixing, double-diffusive and convective mixing
- River flows: turbulence, suspended sediments, bedload, bed forms, hydraulic resistance, flow-biota interactions and ecologically significant transport processes
- Vegetation – interaction with flow at the blade and canopy scale, resistance in vegetated channels, impacts on sediment transport.

A particular emphasis will be on practical challenges related to man-made facilities and structures and environmental management.

General information

All lectures will be given in English. Course notes will be distributed to all participants before classes.
The course will be held by Eawag from 11–20 June, 2012 and the course rooms will be at the Lucerne School of Engineering and Architecture in Horw.

Who should attend?

The course is intended for postgraduate students (MSc or PhD candidates), engineers and scientists in industry, government or research institutions involved in environmental engineering, planning or impact prediction.
A prerequisite for attendance is a first degree or diploma in civil, environmental or mechanical engineering/science or an equivalent qualification in a cognate discipline.
The course is open to participants from all countries.

Application and information

Deadline: 30 March 2012
Registration form: To apply, please send your CV and a short statement of motivation (topic/interest) before 30 March 2012 to summerschool2012@eawag.ch. The number of participants will be limited to 30.

Course fee: CHF 500.– includes lecture notes, coffee breaks and local transportation (it does not include meals and accommodation).

Housing / accommodation: There is a block reservation until 8 April 2012 at the Youth Hostel in Lucerne. After approval to the Summer School, please book immediately by using the booking form on the Summer School website. Alternatively there are only a very small number of inexpensive hotels available.

Further information about the course (travel, housing, excursion, finances) can be found under:
http://www.eawag.ch/lehre/schools/kb2012/index

Lecturers

Prof. George S. Constantinescu, Department of Civil and Environmental Engineering (Eng.), University of Iowa, USA
Prof. Peter A. Davies, Department of Civil Eng., University of Dundee, UK
Prof. Dieter Etling, Institute of Meteorology and Climatology, University Hannover, Germany
Prof. Gregory A. Lawrence, Department of Civil Engineering, University of British Columbia, Canada
Prof. Joseph HW. Lee, Department of Civil and Env. Engineering, Hong Kong University of Science & Technology, Hong Kong, China
Prof. Heidi M. Nepf, Department of Civil and Env. Eng., MIT, USA
Prof. Vladimir I. Nikora, School of Engineering, University of Aberdeen, UK
Prof. Fernando Porté-Agel, Institute of Env. Engineering, ENAC EPFL, Lausanne, Switzerland
Prof. Alfred J. Wüest, Surface Waters – Research and Management, Eawag, Kastanienbaum, Switzerland

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eawag aquatic research

Eawag is a Swiss-based and internationally linked aquatic research institute committed to an ecological, economical and socially responsible management of water – the primary source of all life. It carries out research, teaching and consulting and forms a link between science and practical application.
http://www.eawag.ch