

# GERHARD JIRKA SUMMER SCHOOL ON *ENVIRONMENTAL FLUID MECHANICS: modelling and its role in sustainable development*

**Date:** December 13-20, 2014

**Location:** The Hong Kong University of Science & Technology (HKUST) Jockey Club Institute for Advanced Study Institute (IAS), Hong Kong.

**Organisers:** Conveners: MS Ghidaoui and JHW Lee; Secretary: G. Kikkert, The Department of Civil and Environmental Engineering at HKUST.

**Sponsors:** IAS at HKUST; The School of Engineering at HKUST; The Department of Civil and Environmental Engineering at HKUST; The International Association for Hydro-Environment Engineering and Research (IAHR); The Fluid Mechanics Committee of IAHR; and IAHR-Hong Kong chapter.

Environmental Fluid Mechanics is concerned with the fluid motions and associated mass, momentum and energy transport processes that occur in the earth's hydrosphere and atmosphere and in engineered systems such as drainage, water supply and waste disposal systems on both local and regional scales. These flows interact with nearly all human activities and their understanding and modelling is critical for addressing issues in sustainable development.

The School is a signature IAHR event that was founded and energised by the late Professor Gerhard Jirka, with a vision to bring together renowned experts and top graduate students from around the world for a unique, interactive learning experience in environmental fluid mechanics. A central objective of the School has always been to combine theory, experiments and applications, with an emphasis on basic theoretical principles (and their mathematical description) as well as consideration of examples of engineering design and environmental applications. This objective is realised in the School through formal, in-class lectures as well as informal, out-of class excursions and visits. In the School, the students have plenty of opportunities to present their own research projects and to discuss and seek advice on these projects from Lecturers and fellow students.

The school was previously held in Karlsruhe, Germany, in 1999 and 2006; Dundee, Scotland, in 2001; Budapest, Hungary, 2004; Santiago, Chile, 2009; and Lucerne, Switzerland 2012. The 2014 IAHR school builds on the great success of the previous schools. It will cover the fundamental principles of environmental fluid mechanics, their mathematical description and practical significance, and their implication to sustainable development. The fundamental topics that will be covered include turbulence and waves; fate and transport of pollutants; rotating effects in environmental flows; stratified flow; terrestrial energy systems; air trapping and sewer surcharging; water and energy losses due to leaks and blockages in pipes; lakes and reservoirs, sediment transport; jets & plumes; desalination; and Tsunami-induced hydrodynamics and morphology changes. The confirmed speakers and course topics are:

1. V Chu (Canada): Turbulence in shallow flows.
2. B Cushman-Roisin (USA): Environmental transport and fate.
3. P Davies (UK): Rotational effects in environmental flows.
4. J Fernando (USA): Atmospheric boundary layer.
5. M Garcia (USA): Sediment transport.
6. MS Ghidaoui (HKSAR, China): Waves in pressurised hydro-systems.
7. BW Karney (Canada): Energy—an essential concept & metric for environmental flows and sustainability.
8. AWK Law (Singapore): Environmental hydraulics with seawater reverse osmosis desalination.
9. JHW Lee (HKSAR, China): Jets and plumes.
10. H Tanaka (Japan): Tsunami-induced hydrodynamics and morphology changes.
11. S Wright (USA): Air-water interactions in urban drainage systems.

**Language:** all lectures and events will be conducted in English.

**Field-Trip:** The course will be complemented by a one day visit to a sustainable water management infrastructure project (e.g. Shenzhen River Regulation Scheme). More information about the field trip and VISA to China will be uploaded to <http://www.ce.ust.hk/gjss2014> in due course.

**Who Should Attend?** The course is intended for master and doctoral students, engineers and scientists in industry, government or research institutes in the fields of hydraulics, environmental fluids mechanics and coastal processes. The course is open to participants from all countries.

**When and how to apply?** The application deadline is 30<sup>th</sup> of September 2014. To apply, please send your CV along with a short statement (no more than 400 words) of motivation to the following link. Also, please (i) include your current/past research topic and any related projects that you are working on currently and (ii) list of related courses that you took and the grades that were achieved. The number of participants will be limited to 50.

**Where to apply?** Please send your application to Prof. Gustaaf Kikkert at E-mail address: [GJSS2014@ust.hk](mailto:GJSS2014@ust.hk).

**Where to obtain more information?** Please send your queries via E-mail to address: [GJSS2014@ust.hk](mailto:GJSS2014@ust.hk). In addition, a course website has been created (<http://www.ce.ust.hk/gjss2014>) and pertinent information and messages will be uploaded in due course.

**Fees:** HK\$5000—includes lecture notes, a one day field trip to south China, coffee breaks, lunches, one reception and one banquet dinner, and daily bus to and from Tseung Kwan O Mass Transit Railway (MTR) station.

**Accommodation:** a block of rooms at Holiday Inn Express in Tseung Kwan O has been reserved for students at the rate of 935 Hong Kong dollars (\$HK) per night for single occupancy and 468 \$HK/pax for double occupancy. Included are: light breakfast and free WIFI. There will be free bus to bring students to the university in the morning and take them back to the hotel after classes. A booking form will be made available in early October at <http://www.ce.ust.hk/gjss2014>. Please note that students are not required to stay in this hotel and you are free to make other arrangements. However, note that hotels in Hong Kong are often quite full in December and you should make your booking as soon as you receive the acceptance letter from us which will be in early October!

**Scholarships:** There is a limited number of scholarships for outstanding students who are in need of financial support. To apply, a student must provide their detailed CV, grades, two letters of references highlighting the strength of the student, and a statement by the student explaining their financial needs.