

Preface

Hydraulic research is developing beyond traditional civil engineering to satisfy increasing demands in natural hazards assessment and also environmental research. In such conditions, experimental methods draw from various areas of human activities and research, i.e., from physics, biology, chemistry, aerospace research, oceanic research, etc. Our ability to describe processes in nature rests on the observation and experimental methods as well as on theoretical basics of various disciplines. The current volume, being a result of the meeting that took place in Wiece Palace in Poland during the 30th International School of Hydraulics, has an ambition of presenting a kind of state-of-the-art as well as ongoing research projects in which experimental methods play a key role. It is obviously the task that may be only partially fulfilled in one volume but definitely provides a valuable material for researchers and students involved in hydraulic studies all over the world. The authors from numerous laboratories in various countries guarantee a representative sample of different studies lying at the frontier of the field.

This book covers problems differing in scale, subject, used methods, and geographical location. Chapters have been prepared by the leading experts in the field as well as by young researchers from 11 countries from four continents. There were seven invited speakers at the meeting (but only six chapters were submitted to this volume), and they prepared relevant contributions based on their lectures. In fact, two comprehensive chapters deal with various aspects of sediment transport in rivers. The chapter of Dey provides an overview of the theoretical basis of sediment transport with a special emphasis put on the problems of entrainment in the streams characterized by loose boundary. Coleman treats the problem of sediment transport from the perspective of the measuring techniques allowing to investigate the dynamics of the riverbeds. Manson describes unique series of experiments in Iceland rivers pertaining to better understanding of stream metabolism. Two contributions deal mostly with laboratory techniques and the detailed physics of particle movement in open channels. Di Cristo provided a state of the art in particle imaging velocimetry and its applications in hydraulics. Ferreira concentrated more

on revealing and comparing the applicability of laser Doppler anemometry (LDA) and particle imaging velocimetry (PIV) in the studies of turbulence in open-channel flows over mobile and armored beds and to scour mechanisms. Majewski discussed a case study related to the hydrodynamics of Lake Żarnowiec influenced by nuclear and pumped storage power plant. Other chapters in the book deal with a variety of subjects devoted to hydraulic engineering with special emphasis put on experimental techniques.

The meeting in Wiejce was a jubilee 30th School of Hydraulics, and therefore, a few words on the history of this event are relevant in this place. International School of Hydraulics (till 2003 a national event) has very long tradition – it was initiated in 1981 and took place without interruption each year. Throughout all that long 25-year period, it has been successfully organized by the Institute of Hydro-Engineering of the Polish Academy of Sciences. Starting from the 26th, the organization of International Events was taken over by the Institute of Geophysics, Polish Academy of Sciences. The 26th School took place at Goniądz in Biebrza National Park, the 27th at Hucisko (the Eagle's Nest) situated in the heart of Jura Region in southern Poland, and the 28th one at the Podewils Castle in a small town of Krag, the largest fifteenth-century Knight's Castle in Pomerania. Those Schools have been carried out under the auspices of the Committee for Water Resources Management of the Polish Academy of Sciences and International Association of Hydro-Environment Engineering and Research IAHR, particularly its Committee on Experimental Methods and Instrumentation. All events turned out to be a great success and gathered many researchers from various countries, among them the European leaders in the field of hydraulics. Starting from 2008, the International School of Hydraulics takes place every second year.

The next article, 30 Years of the School of Hydraulics, is an excerpt from the lecture of Professor Majewski, the head of 25 Schools, and it provides an overview of the long history of the School of Hydraulics.

There are a few individuals that have to be acknowledged herein. The 30th International School of Hydraulics, and consequently this book would not be possible without the dedicated work of the staff members Anna Łukanowska, Anna Zdunek, Monika Kalinowska, and Robert Bialik. Anna Dziembowska carefully checked the format of all submitted chapters, made various corrections, and assured good quality of English of all chapters of the book. Special thanks go to the members of International Scientific Committee of the School for their continuous support, namely, to Andreas Dittrich, Ian Guymmer, Andrea Marion, Vladimir Nikora, Steve Wallis, and Anders Wörman. All chapters have been reviewed, and I am especially grateful to Włodzimierz Czernuszenko, Janusz Kubrak, Wojciech Majewski, Marek Mitosek, Jarosław Napiórkowski, Michał Szydlowski, and Robert Bialik who assured high professional standard of all contributions.

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