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# Special Issue Dedicated to the Second Brazilian Conference on Boiling, Condensation and Multiphase Flow, São Carlos, Brazil, 03-07 May 2011

It gives us great pleasure to present this special issue highlighting some of the papers presented at the Second Brazilian Conference on Boiling, Condensation and Multiphase Flow held at the University of São Paulo (USP), in São Carlos, Brazil, May 03-07, 2011.

The event was part of the First Multiphase Flow Brazilian Journey and was jointly cosponsored by PETROBRAS and São Paulo Research Foundation (FAPESP). The conference was built on the success of the previous meetings held in Florianópolis in the State of Santa Catarina, southern Brazil. As before, the objective of the conference was to give scientists, engineers and students from Brazil as well as from other countries, an opportunity to get together for the dissemination of the state-of-the-art and recent advances in the field and to enhance future collaborative research activities between them.

More than 100 scientists participated in the event. The program of the First Multiphase Flow Brazilian Journey included seven invited keynotes, twelve lectures by Brazilian specialists and thirty four oral presentations of research papers. The invited keynotes were delivered by worldwide leading researchers in their field as Prof. Akio Tomyiama from Kobe University, Prof. Greter Triggvasson from Worcester Polytechnic Institute, Prof. John R. Thome from École Polytechnique Fédérale de Lausanne and Profs. René Oliemans and Luis M. Portela from Delft University. All research papers were reviewed on full manuscripts by external reviewers and collected together in a CD. Contributed papers have been sorted in sessions on measurement techniques, two-phase flow without phase change, boiling and condensation, multiphase flow fundamentals, CFD and two-phase flow applications. The twelve

lectures on fundamental aspects of multiphase flows are published together in a book.

This special issue of Journal of the Brazilian Society of Mechanical Sciences and Engineering presents a selection of eight papers presented in the conference. The topics covered include film fraction measurements in a Venturi scrubber, superficial void fraction measurements by using the wire-mesh technique, statistical characterization of the two-phase slug flow in a horizontal pipe, flow boiling in micro-scale channels, a comparison between numerical and experimental results for natural circulation in nuclear reactors and a discussion on the main criterion to determine the transition region from stratified flow to slug or roll-waves and a paper that presents a literature review on two-phase flow pressure drop and heat transfer during flow boiling in tubes containing twisted-tape inserts and the development of a new correlation to predict pressure drop in tubes containing such devices. The volume contains also a kind contribution of Prof. René Oliemans in which the author presents a comprehensive state-of-the-art review on two- and three-phase oil/water/gas flows in horizontal and inclined pipes addressing the relevant flow-pattern-dependent model capabilities to compute oil/water pressure loss and hold-up. This review concludes with an outlook on future research directions in this field.

Finally, we thanks to all members of the organizing committee, conference delegates, keynote speakers, referees, and authors for their work in ensuring that the Second Brazilian Conference on Boiling, Condensation and Multiphase Flow and the First Multiphase Flow Brazilian Journey were a success. In particular we thank PETROBRAS and the Brazilian Society of Mechanical Sciences and Engineering who have sponsored this special issue.