

In memoriam

**Dr. Novak Zuber
1922-2013**



Dr. Novak Zuber, a pioneer in two-phase flow and heat transfer, was born in Belgrade, Yugoslavia, on December 4, 1922. Prior to his immigration to the United States, Dr. Zuber was a member of the Royal Yugoslavian Air Force (1944-1945) during World War II and attended the University of Rome in Italy (1945-1947). In 1947 until 1949, he became a merchant seaman. Dr. Zuber's intense desire to peruse his scholastic dreams prompted him to jump ship during a seaman tour that skirted close to the United States. He found his way to the University of California at Los Angeles and was able to enroll in their mechanical engineering program. In order to complete his education, he performed odd jobs such as washing dishes, washing cars or gardening. Basically, jobs that did not require a "Green Card". Immigration finally caught up with Novak during grad school. However, by that time, he had impressed the people at UCLA, that they came to his rescue and he was able to complete his degree program, including the B. Sc., M. Sc., and Ph. D. His doctoral dissertation is a classical treatment of the hydrodynamic aspects of boiling heat transfer.

His professional career began with a short stint at Thompson Ramo-Woolridge (1958-1960) before he joined General Electric in 1960. He worked in the General Engineering Laboratory and Research and Development Center. The research he performed there has been a major contribution to the understanding of two-phase fluid flow phenomena. Specifically, he developed and applied the "Drift Flux" model for describing average volumetric concentrations in a two-phase flows systems. This approach has found many important applications in predicting the performance of nuclear power plants and other two-phase flow systems. From 1967 to 1974 he was a Professor of Mechanical Engineering at New York University and at the Georgia Institute of Technology where he supervised seven theses for M. Sc. degrees and six doctoral dissertations, many of which became significant contributions to the two-phase flow and heat transfer literature.

In 1974 and until his retirement in 1991, he was associated with the office of Regulatory Research, US Nuclear Regulatory Commission (NRC). During that time he was responsible for reviewing and guiding the development of the NRC computer codes as tools for assessing safety of nuclear reactor systems. He served as the US representative on the International Committee guiding the 2-D/3-D, a major program to resolve multidimensional effects during large break loss of coolant accidents (LBLOCA). Dr. Zuber was also responsible for developing and demonstrating the code scaling applicability and uncertainty (CSAU) methodology for LBLOCA. Just before his retirement he was responsible for formulating a sever accident scaling methodology. In his retirement he has maintain a high level of professional contribution as a consultant to the Advisory Committee on Reactor Safeguards and to the "Joseph Stefan" Institute in Slovenia.

Over the years Dr. Zuber has made contributions to all aspects of two-phase flow and heat transfer, and many of his papers are landmark publications which have opened the way for subsequent contributions. Dr. Zuber's contributions to the field of two-phase flow and heat

transfer have not gone unnoticed. Dr. Zuber is a fellow of the ASME, has published over 50 technical papers and is a co-editor of several books.

He was awarded the ASME Heat Transfer Division Memorial Award in 1961, the Technical Achievement Award from the Thermal Hydraulics Division of the ANS in 1990, and Meritorious Service Awards and a Special Achievement Certificate from the USNRC for outstanding contributions.

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Dr. Novak Zuber was member of the International Advisory Board of the journal *Thermal Science* published by VINČA Institute of Nuclear Sciences in Belgrade, Serbia.

October 6, 2013, Belgrade

Prof. Dr. Naim Afgan