

Preface

Those who cannot learn from history are doomed to repeat it.

George Santayana

Insanity: Doing the same thing over and over again and expecting different results.

Albert Einstein

The idea for this book on *The History of Multiphase Science and Computational Fluid Dynamics* (CFD) can be traced to a presentation I made upon my receiving the 2008 Ernst W. Thiele Award from the Chicago Section of the American Institute of Chemical Engineers (AIChE) on September 22. I prefaced the presentation ceremony with a short speech beginning with the question “Where did these equations come from?” The idea for writing a book to answer this question strengthened as I organized two sessions at the 2009 AIChE Annual Meeting in Nashville, with help of Madhava Syamlal from the National Energy Technology Center (NETL), to honor our teacher from the Illinois Institute of Technology (IIT), Prof. Dimitri Gidaspow with a Festschrift to honor his 75th birthday. I should mention that Prof. Gidaspow (whom I will frequently refer to simply as Dimitri in context) was a previous recipient of the Ernst W. Thiele Award and was the one who nominated me. Upon the suggestion of Madhava Syamlal (called Syam by his colleagues) and with the generous assistance of Prof. Sankaran Sundaresan from Princeton University, we convinced Donald R. Paul, then the Editor of I&EC Research, to publish a special Festschrift for Prof. Gidaspow. Invitations were sent out to over 50 potential contributors, and a total of 31 papers were published with a preface by the three of us.

The story of multiphase science and computational fluid dynamics (CFD) has never been documented heretofore. This may surprise some readers, but the motivation for modeling transient two-phase flow started with nuclear reactor water safety concerns, the hypothetical loss-of-coolant accident (LOCA), and the emergency core cooling system (ECCS) issue. It is a new and by now a rather robust

science and one which must be told how it came to be before the founders and key contributors pass on. Unfortunately, this has already begun to occur. At least three have done so, and a couple more nearly did.

I was helped in this endeavor with the cooperation of Dimitri Gidaspow, Charles W. Solbrig, Lawrence J. Ybarrondo, Victor H. Ransom, John Ramshaw, and E. Daniel Hughes, all major players in the story, with whom I have had considerable correspondence through emails and telephone and personal conversations over the past several years. If anyone of an amazing chain of incidents, and coincidences had never happened, multiphase science and CFD would never have evolved and the story this book tells would never have materialized. It is almost as though the unfolding of these events had been predestined as described in Part I. I will do my best to convince the reader this is so. The remainder of the book recounts incidents which I call the politics of science and the failure to establish a truly national initiative for multiphase computational fluid dynamics. The book concludes with some of the lessons learned from writing this book and how multiphase science and CFD might or should be applied in the future.

Darien, USA

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