

The Eighteenth Symposium on Thermophysical Properties

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The Eighteenth Symposium on Thermophysical Properties was held at the University of Colorado, Boulder, Colorado, USA from June 24 to 29, 2012. The Symposium was the eighteenth in the well-established series of conferences held roughly every 3 years since 1959. It brought together leading international experts presenting papers on state-of-the-art research associated with the theoretical, experimental, and applied aspects of the thermophysical properties of gases, liquids, and solids, including biological systems. This event was organized by the National Institute of Standards and Technology, the American Institute of Chemical Engineers (AIChE), and ASME International (founded as the American Society of Mechanical Engineers).

There were approximately 600 presentations on the program, representing 432 speakers from 41 countries and about 1300 authors from 49 countries. The participation at the conference was global, with 70 % of the speakers from outside the United States. The featured work impacts some of the larger themes and policy issues of our time: sustainable manufacturing, energy alternatives, and integrated data systems. The Symposium provided opportunities for researchers and practitioners worldwide to meet and discuss a broad spectrum of scientific problems in the fields of thermodynamics and thermophysical properties for a wide variety of systems, together with applications in chemistry, biology, chemical engineering, mechanical engineering, physics, and other areas of science and engineering. Studies of the thermodynamic and transport properties of fluids and solids were broadly represented, as evident from the listing of topic areas.

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The Touloukian Award, a major honor within ASME and the Symposium on Thermophysical Properties for outstanding achievement in thermophysical properties research, was presented to Dr. Michael R. Moldover of the National Institute of Standards and Technology (NIST) and to Professor Peter T. Cummings of Vanderbilt University. Dr. Moldover was honored for “fundamental metrological achievements in thermometry, pressure standards, and a landmark measurement of the universal gas constant; for advances in state-of-the-art of thermophysical property measurements including development of spherical resonators, integration of measurements with theory, and elucidation of critical region behavior.” Prof. Cummings was cited for “distinguished and broad scientific contributions to the theoretical description of the thermophysical and structural properties of water, aqueous solutions, and non-polar fluids; in bulk, at interfaces, and under nano-confinement; and for national leadership in the emerging field of computational and theoretical nanoscience.” Before the awards were presented, Prof. E. Dendy Sloan of the Colorado School of Mines gave the Yeram S. Touloukian Award Lecture, “Natural Gas Clathrate Hydrates.”

The conference was opened with a keynote talk from Dr. Patrick D. Gallagher, director of the National Institute of Standards and Technology (now chancellor of the University of Pittsburgh): “From Thermophysical Properties to Innovations in Advanced Manufacturing.” Two plenary lectures were also given: Prof. Gang Chen (MIT) gave a lecture on “Thermal Transport and Properties in Nanostructured Materials,” and Prof. Athanassios Z. Panagiotopoulos (Princeton University) gave a talk on “Simulations of Self-Assembly in Surfactant and Nanoparticle Systems.” Additional excitement was provided by a local wildfire that was uncomfortably close to the conference venue!

Selected papers from the Symposium are being published as special issues of this journal as well as in *Fluid Phase Equilibria* and the *Journal of Chemical and Engineering Data*. Selection of papers for publication is based on established journal policies of favorable independent reviews by referees. Information on the Eighteenth Symposium is available on the Symposium Website at <http://thermosymposium.nist.gov/>. Planning for the 19th Symposium on Thermophysical Properties is already underway, with this event scheduled for June 21 to 26, 2015 in Boulder, Colorado.

It is a pleasure to acknowledge the expertise and dedication of the many individuals who contributed to the successful organization of the Symposium and to the preparation of these special issues. Among those are the authors and invited speakers, the chairs and organizers of the sessions, the referees of the papers, and the members of the Joint ASME-AIChE Committee on Thermophysical Properties. We acknowledge the support of the Thermophysical Properties Division of the National Institute of Standards and Technology (now the Applied Chemicals and Materials Division) and are indebted to many staff members of the Division. Special thanks are due Gary Hardin, Mickey Haynes, Chris Muzny, and Marilyn Yetzbacher for their efforts on behalf of the Symposium: their expertise, dedication, and energetic efforts played major roles in the success of the conference. Finally, we thank Virginia Schultz, of the University of Colorado at Boulder Conference Services, whose tireless efforts helped make the Conference run smoothly.