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OBITUARY[†]

Dr. William (Mickey) Haynes (1943–2016)

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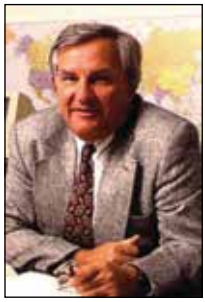

Dr. William (Mickey) Haynes, winner of the 2014 Lifetime Achievements Award of the European Conference on Thermophysical Properties, passed away in his home on 25 February 2016 after a year-long struggle with esophageal cancer. Mickey was a prominent leader in the global thermophysics community who had retired from the National Institute of Standards and Technology (NIST) in Boulder, CO USA in 2003, but who remained active in the field until shortly before his death.

The Lifetime Achievements Award, noted in an editorial in this Journal [1], was just one of a number of honors bestowed upon Dr. Haynes. Mickey was internationally recognized for his technical achievements, leadership in research activities, and service to the thermophysics community. He was also a friend, collaborator, and mentor to colleagues world-wide; the contributors to this note were among those who held Dr. Haynes' honor, integrity, and contributions in very high regard.

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Mickey, born on 8 February 1943, was raised in Martinsville, Virginia, a small city in the southern part of the state. As a young athlete, he was a star of the Martinsville High School basketball team. His buzzer-beating basket to win the 1961 state championship was a transformational event in his home town, as reflected in an opinion piece printed in a local newspaper after the news of his death reached Martinsville. Mickey won an athletic scholarship to the University of Virginia, where he played for a year on the UVA basketball team. However, he left the team after accepting an academic scholarship and began his more concentrated studies in physics. Dr. Haynes earned a B.S. degree in 1965, an M.S. degree in 1967, and his Ph.D. in 1970: all in physics and all at the University of Virginia.

At Virginia, Dr. Haynes studied under the late Prof. Jack Stewart, the Harvard and Princeton educated physicist who had studied under Nobel Laureate Percy Bridgman. Following Prof. Stewart's expertise in high pressure and low temperature physics, Mickey's thesis work at UVA involved measurements of the shear strengths of cryogenic methane and argon [2] and included the development of a new magnetic suspension densimeter for fluids at low temperatures and high pressures [3]. Mickey's dissertation and very early publications foretold a research career based on very careful measurements, creative apparatus development, and absolute dedication to the science: he was involved in every meticulous detail from designing a sample holder to the placing of commas in the archival publication. His thesis research at Virginia led to the offer of a Postdoctoral Research Associateship (through the U.S. National Research Council) in the Cryogenics Division at the National Bureau of Standards (NBS, later re-named to NIST).

Mickey started at the NBS Boulder Laboratories in 1970, and he continued his career in Boulder until his formal retirement in 2003. After retirement, he continued to serve NIST and the thermophysics community as a NIST Scientist Emeritus, and beginning in late 2015, he served as Chair of the NIST Boulder Editorial Review Board until his death.

Throughout his research career at NBS and NIST, Dr. Haynes' experimental research work focused on characterizing fluids and fluid mixtures through their thermodynamic and transport properties. Mickey was responsible for the development of several state-of-the-art apparatus. Two examples are the new generation of magnetic suspension densimeters [4] and a torsional crystal viscometer [5]. These instruments were generally used for property measurements at low and high temperatures and across a broad range of pressures. As part of the celebration of the 50th Anniversary of the NIST Boulder Laboratories in 2004, historically significant work was recognized: three papers of Dr. Haynes were included in the collection of significant papers from the first 50 years of the NIST Boulder Laboratories [6–8]. Dr. Haynes has an enduring

reputation as a careful metrologist: his precision property measurements for a number of systems still underpin the analysis of numerous engineering applications. Even after Mickey entered the scientific leadership track at NIST, his affinity for laboratory work continued—he was often the one who came in at night and on weekends to fill the liquid nitrogen dewars for his colleagues' experiments.

As Dr. Haynes was asked to accept increased responsibilities within the organization, his career and leadership at NIST advanced rapidly. In 1985, Dr. Haynes became Group Leader of the Properties of Fluids Group in the Thermophysics Division at NIST. In 1989, he became Deputy Chief of the Thermophysics Division, although he continued his role closer to the laboratory bench, as Group Leader, for ten years. In 1994, he was named Assistant Director of the NIST Chemical Science and Technology Laboratory, and in 1999 he was appointed as Chief of the Physical and Chemical Properties Division. In these positions, he provided leadership of the fluid properties research program at NIST. He also began his lifelong friendship with the current Director of NIST, Willie May, who recently noted that Mickey "was a very special person and I feel especially privileged to have known and spent so much time with him and his wonderful family." Mickey developed a large network of mutually devoted professional friendships, and he was well known, inside and outside of NIST, for his vision of a program that integrated experimental measurements and instrument development with theoretical models and data that would be of direct use to a user community. These stakeholders and personal friends included those requiring thermophysical and thermochemical property information for specific technological applications, as well as scientists exploring the foundations of matter and thermal sciences.

Dr. Haynes was recognized within NIST for his leadership of people and the development of impactful programs. He was awarded the U.S. Department of Commerce Silver Medal in 2002. Upon his retirement, Dr. Haynes was elected to the NIST Portrait Gallery of Distinguished Scientists, Engineers, and Administrators. These are both very high honors bestowed on the very top echelon of NIST scientific and administrative leaders.

Dr. Haynes' conceptual framework for an integrated program at NIST—measurement, theory, and data-was applied to a number of problems. In particular, Mickey led large-scale efforts on natural gas systems, properties of alternative refrigerants, and thermophysical properties of air. In each case, Mickey provided leadership to researchers within NIST, and with a number of partners throughout the United States and across the globe. Information developed from these programs has been disseminated in data systems available from NIST, e.g., [9,10] and conventionally published articles, equations, and tables, e.g., [11].

In addition to Dr. Haynes' technical work and research leadership, he is well known for his considerable service to the thermophysics community. This was typified by his activities related to conferences around the world. He was active in the European and Asian Thermophysical Properties Conferences, having served on the International Organizing Committee of the former since 1998 (as the sole U.S. member asked to serve), and serving, variously, on Scientific, Program, and International Advisory Committees for the latter at meetings held in China, Japan, and Korea. Indeed, Dr. Haynes was a leader in the movement, decades ago, to coordinate the timing of the North American, European, and Asian Thermophysical Properties Conferences: they remain on a synchronous 3-year rotating schedule. Within the U.S., and as part of his leadership roles within ASME, he participated in the 1977 Symposium on Thermophysical Properties (Gaithersburg, MD); has served on the Symposium organizing committees (ASME K7 and Joint ASME-AIChE Committee) since 1994; chaired/co-chaired/or organized the 13th and 14th Symposia on Thermophysical Properties; and advised the conference chairs at every triennial Symposium since 1991 through the 19th Symposium on Thermophysical Properties held in June of 2015.

It is difficult to enumerate all of Mickey's contributions to thermophysics and the honors bestowed upon him throughout his career. He received the Russell B. Scott Memorial Award for Outstanding Paper at the 1981 Cryogenic Engineering Conference; was elected to Fellowship of the American Physical Society in 1999; and was named Fellow of ASME in 2015. As mentioned above, Dr. Haynes was presented in 2014 with the Lifetime Achievement Award of the European Conference on Thermophysical Properties at its meeting in Porto, Portugal [1]. In 2015, he received the Symposium Award at the 19th Symposium on Thermophysical Properties recognizing *long term and significant service to the Symposium; substantial contributions to the international thermophysical properties community; and leadership in a technical or programmatic area of thermophysics.*

Dr. Haynes worked closely with a number of journals in the field of thermophysics. He served on the Editorial Boards at various times for the International Journal of Thermophysics, the Journal of Chemical and Engineering Data, Cryogenics, and the Review of Scientific Instruments. He was the Editor-in-Chief of the International Journal of Thermophysics from 1997 to 2014, where he not only helped increase the size and scope of the journal, but also led the research directions in thermophysics through his guidance of the Editorial Board. He is well known for his keen editor's eye, and publication in Dr. Haynes' journal was a milestone for researchers and engineers throughout the world. In 2009, Dr. Haynes became the Associate Editor of the CRC Handbook of Chemistry and Physics. He took charge of the Handbook as Editor-in-Chief for the 2010 edition: he remained Editor-in-Chief through the current

97th edition (2016) [12] and worked towards its completion until a few weeks before his death. This resource is used and cited by many of us who require accurate compilations of information at the basis of our profession. Dr. Haynes instituted new standards of review and analysis of every entry in the Handbook. He has worked with numerous subject matter experts to improve and expand the reference work, and advanced its entry into engineering applications through electronic editions. Additionally, he wielded his editor's pen to improve all of the manuscripts prepared throughout the NIST Boulder campus as Chair of the Boulder Editorial Review Board in the last several months.

For the last decade, Mickey also wrote a very popular column in the NIST alumni magazine, describing the local scene—"Boulder Babble"—for the NIST family now in many corners of the U.S. The editor of the Standards Alumni Association Newsletter, Roger Martin, noted these contributions, as "fresh, authentic, reflected Boulder citizens and their approach to the world, and fairly treated what were some of the most controversial current local issues."

To add some personal reflections, we note that Mickey Haynes was a man of honor and integrity who treated everyone with respect, regardless of station or stature. He was a friend, a mentor, an advisor. He was careful, meticulous, and accurate in all of his endeavors. Dr. Haynes often worked seven days per week, and was very often "at the lab" until after midnight: he was a dedicated professional.

Outside of NIST, the thermophysics community, and his editorial work, he was an avid sports fan who loved to participate in golf, squash, hiking, biking, and travel. He continued to cheer for his University of Virginia teams to the end; followed collegiate basketball carefully; and applauded the Denver Broncos football (U.S.) team through its 2016 Super Bowl season.

Mickey is survived by his wife of 51 years, Toni Haynes, his son, Mike, a granddaughter, two sisters and several nieces and nephews. He was predeceased in 2013 by his daughter, Jennifer. He is also survived by several generations of younger scientists, for whom he was a superb mentor.

We are aware of a number of other tributes under consideration to honor the memory of Dr. William (Mickey) Haynes. We are pleased to invite correspondence from those who may need additional information about his career.

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