

Brief Biography: Cristina Amon

Cristina H. Amon received her Mechanical Engineering diploma degree from Simón Bolívar University in 1981 and after two years of engineering practice and teaching, continued her education at the Massachusetts Institute of Technology where she earned her M.S. and Sc.D. degrees in 1985 and 1988, respectively. She was the Raymond J. Lane Distinguished Professor of Mechanical Engineering, and Director of the Institute for Complex Engineered Systems at Carnegie Mellon University until 2006 when she joined the University of Toronto as the Dean of the Faculty of Applied Science and Engineering, and the Alumni Chair Professor in Bioengineering of Mechanical and Industrial Engineering.

Professor Amon's research pioneered the development of Computational Fluid Dynamics (CFD) for formulating and solving thermal design problems subject to multidisciplinary competing constraints. This led to her creation of a *multi-stage concurrent thermal design methodology* based on hierarchical model refinement, which combines CFD, non-deterministic experiments and Bayesian statistics. She has made contributions on self-sustained oscillatory flows and *thermal management of electronics*, elucidating flow destabilization mechanisms which induce heat transfer enhancement in self-sustained oscillatory flows with Lagrangian chaotic mixing; quantifying conjugate time-dependent effects in electronics with multi-material composition and multi length and time scales; and developing on-demand recuperative transient thermal technologies for wearable computers. Among her other research contributions are transport in biological systems, intravenous blood oxygenators and abdominal aortic aneurysms, and transport in micro-scale direct methanol fuel cell. More recently, her research group has been focused on developing numerical algorithms for sub-micron and nano-scale heat transport in semiconductors (molecular dynamics, lattice-Boltzmann method and phonon Boltzmann transport). To disseminate these results, she has been invited to deliver keynote lectures world wide. She has contributed twelve book chapters, one McGraw Hill custom textbook, and over 250 refereed articles in education and research literature.

Her achievements in education cover the whole spectrum of integrating education, research and engineering practice; conceiving, developing and teaching the freshman course *Fundamentals of Mechanical Engineering*; and creating a nurturing environment for students, advising 67 undergraduate and 19 master projects, and mentoring 31 doctoral students, twelve of whom hold faculty positions. Dedicated to outreach, she co-developed *Engineering Your Future*, the Society of Women Engineers (SWE) workshop for female and minority high school students, and *Moving 4th into Engineering*, an outreach program targeted toward fourth graders. She has been recognized by SWE as their Distinguished Engineering Educator in 1999 and Professor of the Year for 2000. Cristina Amon was also the recipient of both awards given by Carnegie Mellon's College of Engineering, the *George Tallman Ladd Award* for Excellence in Research in 1991 and the *Benjamin Teare Award* for Excellence in Engineering Education in 1998. The American Society of Mechanical Engineers (ASME) honored her with the *Gustus Larson Memorial Award* for outstanding achievements in 2000, and the ASME Pittsburgh chapter named her *Engineer of the Year* in 1999. She received several awards from the American Society for Engineering Education (ASEE), including the prestigious 1997 *George Westinghouse* and 2002 *Ralph Coats Roe Awards*. In 2003, she received the *Hispanic Engineer National Achievement Education Award* and, in 2005, she was named one of America's most important Hispanics in

technology and business. Among her other recognitions are the 2003 *Electronics and Photonics Packaging Clock Award*, best papers awards, and the 2004 ASME *EPPD Thermal Management Award*, for Outstanding Contributions in Thermal Management Applications to the Field of Electronic and Photonic Packaging.

Active in professional societies and executive boards, Cristina Amon currently serves as member of MKS Instruments Inc Director Board, *ASEE* Engineering Deans Council Executive Board, Global Engineering Dean's Council Chair, and has served as chair-elect, chair and retiring chair (2004-2007) of the AAAS Section on Engineering, and president of the SWE Pittsburgh Chapter (2004-2005). She has served on external advisory boards at several universities, including Stanford University, University of Pennsylvania, UCLA, Case Western, the City University of New York and University of Texas. She was elected chair of *IEEE/ASME* ITherm 2002 Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems and program chair of the 2005 Heat Transfer conference. She served as *ASME* Heat Transfer Division Membership Recognition Committee Chair (1996-1998), *K-3* Honors and Awards Committee Chair (2000-2001), *K-16* HTD Electronics Cooling Committee Vice-Chair (1997-2000) and Chair (2000-2003), *Pi Tau Sigma* faculty advisor (1994-1996), and *ASEE* campus representative (1993-1997). She is co-founder of Women In Non-traditional Graduate Studies (WINGS) and served as its first faculty adviser since its inception in 1989 until 1992. Her editorship roles include the *ASME* Journal of Heat Transfer, *IEEE* Transactions on Components and Packaging Technology, and Heat and Mass Transfer. She is Member of the National Academy of Engineering (NAE) and Fellow of AAAS, ASEE, ASME, CSME, EIC and IEEE.