2016 Acta Materialia Gold Medal Award

The recipient of the 2016 Acta Materialia Gold Medal is Dr. Sungho Jin, Professor Emeritus of University of California, San Diego. Prior to his recent retirement, he was Distinguished Professor of Materials Science in the Departments of Mechanical and Aerospace Engineering at UCSD and held Iwama Endowed Chair. He also served as the Director of the university-wide Materials Science & Engineering Program at UCSD for the past 13 years.

Sungho Jin received B.S. degree in Metallurgy in 1969 from Seoul National University, and M.S. and Ph.D. degrees in Materials Science in 1971 and 1974, respectively, from the University of California, Berkeley. He joined Bell Laboratories at Murray Hill, New Jersey in 1976 as Member of Technical Staff and later became Technical Manager to carry out forefront materials/devices research for 26 years. He then joined UC San Diego in 2002 for academic educational service and research activities for 13 years. He also served as a Principal Investigator at the Center for Magnetic Recording Research (CMRR) at UC San Diego.

Dr. Sungho Jin contributed to the advancement of science and technology with world-class, trend-setting research in the broad fields of electronic, magnetic, optical, superconducting, electronic packaging, and MEMS materials and devices, nano-bio materials, and energy materials. The pioneering and leadership nature of his work is evident by his publications (~400 including 10 in Nature or Science), Science Citation Index (~17,000), US Patents (~250 issued or pending), and invited or keynote talks (~140) at major professional societies. His noteworthy accomplishments include: the discovery (and naming) of Colossal Magneto-Resistance (CMR) phenomenon in the perovskite La-Ca-Mn-O in 1994; his publication in Science, “Thousandfold Change in Resistivity in Magnetoresistive La-Ca-Mn-O Films”, which has ~4,000 citations, and touched upon imagination of many scientists and immensely stimulated world-wide research on CMR manganite materials for a variety of electronic and magnetic applications including ultra-high-density magnetic recording and future spintronics devices; his development of ductile permanent magnet alloys of Fe-Cr-Co (Chromindur) based on spinodal decomposition for reliable and miniaturized telephone receiver applications, for which as many as 10 million cup-shaped magnets per year were manufactured and used in-high quality AT&T telephones; he demonstrated, for the first time, the feasibility of high Tc superconductor (HTSC) wires from the mechanically brittle ceramic superconductors; he initiated the trend and displayed leadership in promoting Lead-Free Solders R&D by organizing the first seven “Lead-Free Solder” symposia for the Metallurgical Society meetings (1993-1997); and he demonstrated that sharply bent zig-zag carbon nanotubes can be fabricated using changes of electric field direction during CVD growth.

More recently, Professor Jin discovered that vertically aligned TiO2 nanotubes on Ti implant metal surface enhanced bone growth by 300%. He discovered novel electronic switching behavior and logic in CVD synthesized carbon nanotube Y-junctions. He developed “Nano-Solders" that can be soldered at low temperatures but can be converted to a higher-melting-point (415^{o}C), tough and ductile intermetallic compound to enable thermally more durable, fatigue- and creep-resistant solder electronic packaging. He designed and produced drug-delivery, hollow sphere nanocapsules with trapped magnetic nanoparticles for magnetically guided tissue penetration and remotely switchable, on-demand release of anti-cancer medications. He designed and demonstrated Smell-o-Vision scent generating device demonstrated for future TV and cell phone displays to release synchronized scents when the corresponding scenes come up on TV screen. This work received much news media attention in 2011 including ABC, NBC and CNBC TV network coverage and Scientific American coverage. Virtual Reality (VR) headsets capable of synchronized scent release have also been demonstrated. He designed new, highly efficient sunlight absorber layer materials for Concentrating Solar Power (CSP) generator systems. He designed smart textiles that can automatically change insulation in response to ambient temperature change to make a person feel always comfortable, thus saving building electrical energy for air-conditioning or heating.

Dr. Jin’s scientific accomplishments have been recognized with many awards and honors, including an election to the US National Academy of Engineering (1999), Fellow of American Physical Society (2003), Fellow of American Society for Metals (1994), TMS Fellow (2000), and inaugural MRS Fellow (2008). He received various awards including the John Bardeen Award (2007), Nano 50 Award (2005), the Albert-Sauveur Achievement Award (2009), the CRS Jorge Heller JCR Award (2012), and TMS Functional Materials Division Distinguished Service Award (2015). He also received the Ho-Am Engineering Prize from Ho-Am Foundation in Korea in 2000 (the most prominent honor in Korea in science and technology). Dr. Jin also contributed to the profession by serving as Principal Editor of Journal of Materials Research (1998 – 2005), as Editor of Acta Materialia (2007–present), as Guest Editors for three JOM Special Topics Series in 1997-1998 on various functional materials, and as Editor for Electronic Packaging, New Encyclopedia of Materials Science and Technology (1999).

Professor Jin will receive his Gold Medal during the 2016 TMS Annual Meeting and Exhibition in Nashville, TN, February 14-18, 2016. A special symposium honoring his accomplishments is being planned during the 2016 TMS Meeting in connection with this award.