NEWS RELEASE

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Professor Narayan is the Winner of 2014 O. Max Gardner Award and Prize, Highest Honor of the UNC System.

The President and Board of Governors of the UNC System have announced the winner of 2014 O. Max Gardner Award to be Professor Jagdish (Jay) Narayan, who is John C. C. Fan Family Distinguished Chair Professor in the Department of Materials Science and Engineering at North Carolina State University. The O. Max Gardner Award is the Highest Faculty Honor of The University of North Carolina System comprising of 17 universities, given annually to one faculty member whose academic and research contributions have made maximum impact on the human race. The Winner receives a medallion and Prize of $35K. Professor Narayan is recognized for his groundbreaking contributions in nanoscience and nanotechnology leading to useful products for the society at large. This is the first in the field of materials science in the 66 year history of the award named after 57th Governor of North Carolina who also served in Roosevelt and Truman administrations. Past winners included Nobel Laureate Oliver Smithies of UNC Chapel Hill. There will be a thirty-minute documentary on UNC-TV (April 16, 2014), covering the unprecedented academic and research accomplishments of Professor Narayan in nanoscience and nanotechnology, which have impacted the society. In addition, NCSU Memorial Bell Tower (Prominent Historical Landmark in Raleigh) will be lighted in Professor Narayan's honor on May 2, after the Chancellor's reception. The award announcement was covered by The News & Observer on April 12, 2014.

Professor Narayan, Senior Fellow of ASM and TMS and Inaugural Fellow of MRS, is also the recipient of TMS 2014 Robert Franklin Mehl Gold Medal and The Institute of Metals Lecture Award. He delivered the Mehl lecture **on Frontiers in Thin Film Epitaxy and Novel Nanostructured Materials** in the Symposium on Frontiers in Nanostructured Electronic and Structural Materials and Their Applications, held in his honor at the 143rd TMS Annual Meeting in San Diego, February 16-20, 2014. The lecture focused on the inherent advantages and challenges of nanomaterials and the design of new materials leading to novel and unique systems with improved properties. This premier TMS Award recognized seminal contributions and discoveries of Professor Narayan in nanomaterials, domain matching epitaxy and new paradigms for epitaxy across the misfit scale, and novel self-assembled magnetic materials, leading to nanomagnetics, spintronics, nanostructured light-emitting diodes (Nano-Pocket LEDs), and smart integrated sensors. Professor Narayan's other honors include: 2014 Mehl Medal from TMS Brazil, 2011 Acta Materialia Gold Medal and Prize, 2012 NCSU Holladay Medal, 2011 NCSU Reynolds Prize, 2011 MRS Forum and 2011 MS&T International Conference in Narayan's honor, 1999 ASM Gold Medal, 2004 Edward DeMille Campbell Lecture and Prize, three IR-100 Awards, 1997 IIT/K Distinguished Alumnus Award, Inaugural MRS Fellow, Life Member and Fellow of TMS, Life Member and Fellow of APS, ASM Fellow, AAAS Fellow, Honorary Member MRS-I, Fellow Bohmische Physical Society, and Life Member and Fellow of National Academy of Sciences (India). Professor Narayan has published over 500 papers in archival journals and received 40 patents which have over 20,000 Citations, 35 Citation Classics with citations over 100 to 1,000 and h-index approaching 70 so far. He has trained and mentored over 65 PhDs, 25 Master's and 35 postdocs, who are highly successful in the field of nanomaterials.

Professor Narayan is the John C. C. Fan Family Distinguished University Professor of materials science and engineering, and also has appointment as Distinguished Visiting Scientist at Oak Ridge National Laboratory. After graduating with distinction and first rank

from India's top institution (IIT, Kanpur) in 1969, Narayan continued his studies at the University of California, Berkeley, and obtained his MS (1970) and PhD (1971) degrees in a record time of two years. He worked as Research Metallurgist at Lawrence Berkeley National Laboratory (1971-72) and Senior Scientist and Group Leader at Oak Ridge National Lab (1972-84), before joining North Carolina State University in 1984 as senior professor and Director of Microelectronics Center of North Carolina. He also served as Director of Division of Materials Research (1990-92) of the National Science Foundation.

Professor Narayan started nanoscience revolution in bulk nanocrystalline material in1981 with his seminal paper in Physical Review Letters on transition-metal nanodots in ceramics. His fundamental discoveries in ion implantation and laser annealing led to novel supersaturated semiconductor alloys and laser-diffused ultrashallow p-n junctions via solute trapping phenomena. His laser annealing research led to discovery of pulsed laser deposition and formation of new materials such as ZnMgO and ZnCdO alloys, where bandgap can be varied systematically from deep ultraviolet to infrared. His recent work has focused on three-dimensional self-assembly of magnetic nanodots, where each dot is aligned with respect to the substrate. This research was hailed by NSF as significant discovery of the year 2004.

Professor Narayan's invention of domain matching epitaxy across the misfit scale has revolutionized epitaxial integration of nanostructured materials in the form of nanolayers, nanodots and nanorods on practical substrates such as silicon(100). The DME paradigm has led to integration of exciting new materials, which include perovskites such as $NdNiO_3$, vanadium oxide, titanium oxide, nickel oxide, and most recently novel topological insulator (Sr_3SnO) and bismuth ferrite with unique magnetic properties (Nano Lett. 2013). The DME paradigm involves the matching of integral multiples of lattice planes across the film-substrate interface, where misfit across the scale can be accommodated via principle of domain variation. All III-nitrides LEDs, lasers and high-power devices with lattice misfit over 15% are grown by DME paradigm on silicon and sapphire substrates. Narayan also invented nanostructured (Nano Pocket) LEDs, where internal quantum efficiency is considerably enhanced through quantum confinement of carriers via thickness variation. This process is adopted universally for manufacturing high-efficiency LEDs. His recent seminal contributions have focused on controlled introduction of defects by pulsed laser irradiation to modify electrical and magnetic properties of near surface nanolayers. The RTFM (room-temperature ferromagnetism) can be introduced in materials such as ZnO, NiO, VO2, Sr_3SnO, $BiFeO_3$ and $BiTiO_3$ to further enhance their functionality. By introducing RTFM into the heterostructures of these materials, he has opened a new frontier of solid state devices with novel and smart functionalities ranging from spin transistors to smart sensors on a chip.

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