

APPENDIX A

Citation and Response of the 2014 O. Max Gardner Award Recipient

DR. JAGDISH (JAY) NARAYAN

Dr. Jagdish (Jay) Narayan, the John C. C. Fan Family Distinguished Chair Professor of Materials Science and Engineering at North Carolina State University, has made groundbreaking contributions to the field of materials science, most notably in domain matching epitaxy, a method of combining nanomaterials that reduces defects in the semiconductor materials that affect LED efficiency. This work led in turn to the development of high-efficiency LEDs that will save energy, reduce greenhouse emissions, and contribute to our nation's energy independence.

Additionally, Dr. Narayan's work has led to the creation of microelectronics with increased functionality and the development of smart structures and sensors that can be used to detect bioterrorist threats, create smart grid technology and impact national security.

Dr. Narayan has published nine books and over 500 papers in scholarly journals as well as 40 U.S. patents, and has been invited to present papers at numerous conferences, symposia and seminars.

In 2011, Narayan received both the Reynolds Prize, NC State's highest honor for excellence in research, teaching and extension, and the Acta Materialia Gold Medal and Prize for pioneering contributions and leadership in materials science worldwide. He received the Alexander Holladay Medal, NC State's highest faculty honor, in 2012, and is the 2014 recipient of the Robert Franklin Mehl Gold Medal, the pinnacle honor from The Materials Society for pioneering contributions in nanomaterials and nanotechnology leading to useful commercial products.

Dr. Narayan has graduated over 65 Ph.D. students and trained numerous postdocs who are employed in leading companies and universities. Since joining NC State's faculty in 1983, Narayan developed eight graduate courses that are connected with his research, three of which are offered via the Engineering Online Network to engineers within the microelectronics and photonics industry.

Elected in 2008 as an Inaugural Fellow of the Materials Research Society, Dr. Narayan is also a Life Member and Fellow of The Materials Society, a Fellow of the American Association for the Advancement of Science, and Life Member and Fellow of the American Physical Society.

Born in India, Dr. Narayan received his Bachelor's degree from the Indian Institute of Technology in Kampur, and his Master's and Ph.D. from the University of California, Berkeley. He came to NC State as a professor in 1983, was named NCSU Distinguished University Professor in 1990, and John C. C. Fan Family Distinguished Chair Professor in 2002.

In recognition of his lifelong mission to improve the quality of life for millions and his unending passion for teaching, research, and extension, the Board of Governors takes great pride in presenting the 2014 Oliver Max Gardner Award to Dr. Jagdish (Jay) Narayan, John C.C. Fan Family Distinguished Chair Professor of Materials Science and Engineering at North Carolina State University.

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Thank you Mr. President! I feel greatly honored with this award and accept it with a profound sense of humility.

I would like to thank Chairman Hans, Mr. Walker and rest of the members of BOGs for bestowing this singular honor, named after our great 57th Governor of North Carolina

- 1) Thank my dear friends and colleagues (some of them are here), my students and postdocs over 100 and counting, and my family, my wife Ratna and my grandson, Roger. My son, Roger Narayan (MD, PHD) regrets to miss this occasion, as he is on the way to Japan for an important International Conference, where he is a Plenary Speaker.
This award is very special!
- 2) Throughout human history, materials have defined our civilization. From Stone Age to Iron Age to Bronze Age to Semiconductors and now Nanomaterials, materials have played a critical role in improving the quality of human life and taking us to a next level. For every advanced technology, there is a materials bottleneck which must be addressed and solved. Our discoveries in nanoscience and nanotechnology have addressed these critical issues.
- 3) This award recognizes our nanoscience and nanotechnology discoveries which have made significant impact on society and quality of our life. Our inventions have created highly efficient Nano-Pocket LEDS for solid state lighting. We have invented new materials for more efficient LEDs, solar cells, high density information storage, transparent conductors, nanooil additives and smart integrated sensors with the computer chip.
- 4) We must do more with less of critical materials, and research innovations in nanomaterials are key to this paradigm, and we can lead the State, the Nation and the World toward a brighter and more secure future.