

Jayant Baliga

Progress Energy Distinguished University Professor
Director, PSRC

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BIOGRAPHY

Prof. Baliga is an internationally recognized expert on power semiconductor devices. He is a Member of the National Academy of Engineering and a Fellow of the IEEE. He spent 15 years at the General Electric Research and Development Center, Schenectady, NY, leading their power device effort and was bestowed the highest scientific rank of Coolidge Fellow. He joined NC State in 1988 as a Full Professor and was promoted to the rank of 'Distinguished University Professor' in 1997. Among his many NCSU honors, he was the recipient of the 1998 O. Max Gardner Award given by the North Carolina University Board of Governors to the one person within the 16 constituent universities who has made 'the greatest contribution to the welfare of the human race'; and the 2011 Alexander Quarles Holladay Medal of Excellence, the highest honor at NCSU from the Board of Trustees.

Prof. Baliga has authored/edited 18 books and over 500 scientific articles. He has been granted 120 U.S. Patents. The IEEE has recognized him numerous times - most recently with the 'Lamme Medal' at Whitehall Palace in London. Scientific American magazine included him among the 'Eight Heroes of the Semiconductor Revolution' when commemorating the 50th anniversary of the invention of the transistor.

Prof. Baliga invented, developed and commercialized the Insulated Gate Bipolar Transistor (IGBT) at GE. The IGBT is extensively used in the consumer, industrial, lighting, transportation, medical, renewable energy, and other sectors of the economy. It has enabled enormous reduction of gasoline and electrical energy use, resulting in huge cost savings to consumers, and reduction of world-wide carbon dioxide emissions. A detailed report on the applications and social impact of the IGBT is available. He received the National Medal of Technology

RECENT NEWS



NC State ECE Faculty Members Ranked as Top Electronics and Electrical Engineers in United States

Posted on March 3, 2022 | Filed Under: News

Fourteen ECE faculty members have been ranked as the Top Electronics and Electrical Engineering Scientists in the United States.

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Dr. Baliga Named Fellow by National Academy of Inventors

Posted on December 23, 2016 | Filed Under: Awards and Faculty and News and Research

Three faculty members at North Carolina State University are being named fellows by the National Academy of Inventors (NAI). The new NAI fellows are B. Jayant Baliga, Distinguished University Professor of Electrical Engineering; Ruben Carbon ...

and Innovation, the highest form of recognition given to an engineer by the United States Government, from President Obama in October 2011, at the White House; and the North Carolina Award for Science from Governor Purdue in October 2012.

EDUCATION

Ph.D. 1974

Electrical Engineering

Rensselaer Polytechnic Institute, NY

Master's 1971

Electrical Engineering

Rensselaer Polytechnic Institute, NY

Bachelor's 1969

Electrical Engineering

Indian Institute of Technology, Madras

RESEARCH FOCUS

- Power Electronics
- Power Management ICs
- Power Semiconductor Devices
- Power Systems

FUNDED RESEARCH

- PowerAmerica Baliga Task 2.8 and 2.83
- PV Inverter Systems Enabled by Monolithically Integrated SiC based Four Quadrant Power Switch (4-QPS)

HIGHLIGHTED AWARDS

- Alcoa Foundation Distinguished Engineering Research Award (1995)
- The R. J. Reynolds Tobacco Company Award for Excellence in Teaching, Research, and Extension (2000)
- National Inventors Hall of Fame (2016)
- Alexander Quarles Holladay Medal for Excellence (2011)
- IEEE Medal of Honor (2016)
- North Carolina Award for Science (2012)
- National Medal of Technology and Innovation (2011)
- The Global Energy Prize (2015)
- Member of National Academy of Engineering (1993)
- O. Max Gardner Award (1998)
- John S. Risley Entrepreneur of the Year Award (2013)

AWARDS & HONORS



Baliga Book Wins 2016 PROSE Award

Posted on February 16, 2016 | Filed Under: Awards and News

The PROSE Awards were announced February 4th at the annual conference of the Association of American Publisher's Professional and Scholarly Publishing Division in Washington, DC. PROSE honors the best in professional and scholarly publishi ...

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RECENT MEDIA MENTIONS



How B. Jayant Baliga Transformed Power Semiconductors

April 22, 2014

The 2014 IEEE Medal of Honor recipient pioneered the IGBT, now found in cars, lighting, robots, and more.



Inventors Hall of Fame to Induct Indian-American Scientist

November 23, 2015

NC State electrical engineer to be inducted into the prestigious National Inventors Hall of Fame for his invention of the insulated gate bipolar transistor, a semiconductor power switch used in many modern appliances from electric cars to air-conditioners. Bantval Jayant Baliga, engineering, featured.



Dr. B. J. Baliga Awarded 2014 IEEE Medal of Honor

May 13, 2014

NC scientist awarded the IEEE 2014 Medal of honor for his pioneering work on power electronic devices. B. Jayant Baliga, electrical & computer engineering, featured.

RECENT PUBLICATIONS

- 2.3 kV 4H-SiC Planar-Gate Accumulation Channel Power JBSFETs: Analysis of Experimental Data (2021)
- 3.3 kV 4H-SiC Planar-Gate MOSFETs Manufactured using Gen-5 PRESiCE (TM) Technology in a 4-inch Wafer Commercial Foundry (2021)
- 650-V 4H-SiC Planar Inversion-Channel Power JBSFETs With 55-nm Gate Oxide: Relative Performance of Three Cell Types (2021)


- 2017 - Inducted Fellow of the National Academy of Inventors
- 2017 - Inducted one of the five Foreign Fellows of Indian National Academy of Engineering
- 2016 - Honorary Doctor of Science Degree, I. I. T. - Madras
- 2015 - Global Energy Prize, President of the Russian Federation
- 2015 - IEEE EDS Celebrated Member Award
- 2013 - IEEE Life Fellow
- 2013 - Inducted into Rensselaer Alumni Hall of Fame
- 2013 - NCSU Risley Entrepreneur of the Year Award
- 2012 - BCBS 'Eminent Cottonian' Award
- 2012 - IEEE International Electron Devices Meeting Recognition at Plenary Session
- 2012 - Named among top 35 Indian Thinkers since 1975 by India Today, a leading news magazine in India with a readership of over 15 million.
- 2012 - Profiled in Forbes India 'Innovation Special' Magazine: "Among the 18 Great Minds who are doing cutting-edge work"
- 2010 - Inducted into Electronic Design Engineering Hall of Fame
- 2005 - Member, European Academy of Sciences
- 2004 - IEEE-IPSPD Contributory Award for Founding the conference and serving as General Chairman in 1993
- 2001 - ISI "100 Most Highly Cited Scientists in Engineering"
- 2000 - Distinguished Alumnus Award, Indian Institute of Technology, Madras
- 2000 - National Academy of Engineering re-classified as Member
- 1999 - Bell Tower Lighting for 100th US Patent (NC State)
- 1999 - IEEE Lamme Medal for Invention and Development of the IGBT
- 1998 - IEEE Ebers Award for technical contributions to Electron Devices (ED Society)
- 1998 - O Max Gardner Award for 'greatest contribution to the welfare of the human race' (University of North Carolina Board of Governors)
- 1997 - Scientific American Magazine 'One of the Eight Heroes of the Semiconductor Revolution'
- 1996 - "Ten People to Watch in the Triangle", News and Observer, Raleigh
- 1995-2002 - Honorary Editorial Advisory Board, Solid-State Electronics Journal
- 1995 - Alumni Association Outstanding Research Award (NC State)
- 1995 - BF Goodrich Collegiate Inventors Award, Inventors Hall of Fame
- 1993 - General Chairman, IEEE International Symposium on Power Semiconductor Devices
- 1993 - IEEE Liebman Award for contributions to 'Smart Power Technology'
- 1993 - National Academy of Engineering elected at age 45 as Foreign Affiliate from India
- 1992 - Pride of India Award (First Recipient), BSS Society, USA
- 1992 - Vice-General Chairman, IEEE International Symposium on Power Semiconductor Devices
- 1991 - IEEE Newell Award for technical contributions to Power Electronics (PE Society)
- 1991 - Technical Program Chairman, IEEE International Symposium on Power Semiconductor Devices
- 1988 - Whitney Hall of Technical Achievers, General Electric Company
- 1985-1990 - Associate Editor, IEEE Transactions on Electron Devices
- 1984 - IR 100 Award for "Gallium Arsenide Schottky Power

- A New User-Configurable Method to Improve Short-Circuit Ruggedness of 1.2-kV SiC Power MOSFETs (2021)
- Advanced 650 V SiC Power MOSFETs With 10 V Gate Drive Compatible With Si Superjunction Devices (2021)
- Assessment of Linear, Hexagonal, and Octagonal Cell Topologies for 650 V 4H-SiC Inversion-Channel Planar-Gate Power JBSFETs Fabricated With 27 nm Gate Oxide Thickness (2021)
- Comparison of BaSiC(DMM) and BaSiC(EMM) Topologies to Enhance Short-Circuit Capability in SiC Power MOSFETs (2021)
- Eliminating Repetitive Short-Circuit Degradation and Failure of 1.2-kV SiC Power MOSFETs (2021)
- Performance Comparison and Demonstration of 3-L Voltage Source Inverters Using 3.3 kV SiC MOSFETs for 2.3 kV High Speed Induction Motor Drive Applications (2021)
- Performance Enhancement of 2.3 kV 4H-SiC Planar-Gate MOSFETs Using Reduced Gate Oxide Thickness (2021)

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Rectifier"

- 1984 - Science Digest Magazine's '100 Brightest Young Scientists in America'
- 1983 - GE Coolidge Award (Highest Scientist Designation)
- 1983 - GE Dushman Award for 'The Insulated Gate Bipolar Transistor'
- 1983 - IEEE Fellow elected at age 35 for contributions to Power Semiconductor Devices
- 1983 - IR 100 Award for "Insulated Gate Transistor"
- 1982 - IEEE Region I Award
- 1974 - Allen B Dumont Prize (RPI, Top PhD Graduate)
- 1969 - Philips India Medal (IIT, Madras, Top EE Graduate)
- 1969 - Special Merit Medal (IIT, Madras, Valedictorian)

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VISIT

APPLY

VALUES

GIVE

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CENTENNIAL CAMPUS

- Engineering Building II (EB2)
- Monteith Research Center (MRC)
- Keystone Science Center (KSC)
- Metered Parking

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