



RESEARCH STARS

Groundbreaking research is taking place in South Carolina.

*SOUTH CAROLINA CENTERS OF ECONOMIC EXCELLENCE
RESEARCH . INNOVATION . INVESTMENT.*

SOUTH CAROLINA IS COMMITTED TO BUILDING AN ECONOMY BASED ON INNOVATION. A CORNERSTONE OF THIS COMMITMENT IS THE STATE'S VISIONARY CENTERS OF ECONOMIC EXCELLENCE (CoEE) PROGRAM, ESTABLISHED BY THE S.C. GENERAL ASSEMBLY IN 2002 AND FUNDED THROUGH THE S.C. EDUCATION LOTTERY. THROUGH CoEE, SOUTH CAROLINA IS TAKING A STATEWIDE, COLLABORATIVE APPROACH TO FUNDING AND SUPPORTING HIGH-TECH RESEARCH THAT IS LIKELY TO RESULT IN WELL-PAYING JOBS AND ENHANCED ECONOMIC OPPORTUNITIES FOR THE PEOPLE OF SOUTH CAROLINA. CoEE IS ALSO PLAYING A HUGE ROLE IN SOUTH CAROLINA'S NATIONAL AND GLOBAL COMPETITIVENESS.

BECAUSE OF CoEE, SOUTH CAROLINA'S RESEARCH UNIVERSITIES (CLEMSON UNIVERSITY, THE MEDICAL UNIVERSITY OF SOUTH CAROLINA, AND THE UNIVERSITY OF SOUTH CAROLINA) HAVE RECRUITED SOME OF THE WORLD'S TOP "RESEARCH STARS" TO THE STATE. THESE SCIENTISTS AND ENGINEERS ARE LEADING THE CENTERS OF ECONOMIC EXCELLENCE AND ARE WORKING IN FIELDS WITH HIGH POTENTIAL FOR INNOVATIVE OR COMMERCIALIZED RESEARCH, WHICH CAN BE CONVERTED INTO PRODUCTS, SERVICES, AND JOBS TO DRIVE THE ECONOMY.

THESE ELITE RESEARCHERS ARE BRINGING THEIR GROUNDBREAKING WORK TO SOUTH CAROLINA THANKS TO THE UNIFIED COMMITMENT TO RESEARCH AND INNOVATION DEMONSTRATED BY THE STATE'S GOVERNMENT, INDUSTRY, AND ACADEMIA. BECAUSE OF THE TREMENDOUS LONG-TERM VISION OF LEADERS FROM ALL THESE SECTORS, SOUTH CAROLINA HAS A BRIGHT FUTURE AND A COMPETITIVE, WINNING ECONOMY.



★ DR. ROBERT J. ADAMS

CoEE ENDOWED CHAIR IN STROKE AT THE MEDICAL UNIVERSITY OF SOUTH CAROLINA

Reducing the ravages of stroke through treatment and prevention

Dr. Adams' research is in the field of clinical neurology, with a focus on preventing strokes and on developing new ways to deliver stroke care to patients. Working with the American Stroke Association, Adams is spearheading a program to help hospitals obtain designation as a certified Joint Commission on Accreditation of Healthcare Organizations (JCAHO) Stroke Center. The certification is designed to better prepare hospitals to provide comprehensive stroke treatment. Adams is currently assisting a number of sites that want to bolster their acute stroke care. He has established the REACH MUSC program, which connects MUSC neuroscience specialists with partner sites via the Internet to provide round-the-clock stroke care. In his mission to web-enable hospitals, Adams helped develop the company REACH Call, Inc. REACH Call provides system equipment, software, and decision support for urgent specialist consultations over the Internet. It also brings expertise to remote sites to assist in emergency evaluation and treatment of acute stroke.

- ★ Directed some of the most leading-edge stroke trials ever conducted, including the first randomized clinical trials of stroke prevention in children. A national trial he led has become the standard-of-care approach to primary stroke prevention in children at risk of stroke.
- ★ Is a past chair of the American Stroke Association Stroke Advisory Committee; served on the board of directors for the American Heart Association.
- ★ Received the Award of Meritorious Achievement from the American Heart Association for his leadership at the national level in the development and oversight of the JCAHO Primary Stroke Center Certification program.
- ★ B.S. in Electrical Engineering from St. Louis University, M.S. in Engineering Design and Economic Evaluation from the University of Colorado, M.D. from the University of Arkansas.

★ DR. GARY ASTON-JONES

WILLIAM H. MURRAY COEE ENDOWED CHAIR IN NEUROPATHOLOGY
AT THE MEDICAL UNIVERSITY OF SOUTH CAROLINA

Developing new treatments for Attention Deficit Disorder

Brain mechanisms of motivation and cognitive processes are at the center of Dr. Aston-Jones' work, with particular emphasis on attentional deficits in certain mental disorders. Problems with brain attentional functions are believed to be behind conditions such as Attention Deficit Disorder (ADD) and autism. In fact, Dr. Aston-Jones' research helped lead to a new drug treatment for ADD. His other work has applications for better determining the specific processes involved in learning, dementia, addiction, and depression. Dr. Aston-Jones' work has the potential to improve the lives of countless individuals and could help grow South Carolina's presence in the life sciences industry.

- ★ Served as director of the Laboratory for Neuromodulation and Behavior, as well as the director of the Neuroscience of Addiction Research Center, at the University of Pennsylvania.
- ★ Has received continuous funding from the National Institutes of Health for his work since 1983.
- ★ B.A. from the University of Virginia, Ph.D. in Neurobiology from California Institute of Technology, Postdoctoral Fellow at the Salk Institute.





★ DR. BRIAN BENICEWICZ

UNIVERSITY OF SOUTH CAROLINA NANOCENTER CHAIR OF MATERIAL SCIENCE AND ENGINEERING

Helping the plastics industry develop new and better products

Dr. Benicewicz is helping South Carolina play a leading role in the future of nanoscience and plastics. Nanoscience can be used to help the state's plastics industry develop new products and improve existing ones. The Palmetto State is one of the nation's top producers of plastics, specifically polymers that are used to manufacture packaging products for items such as juices, water, soft drinks, household cleaners, and cosmetics. Dr. Benicewicz's research funding includes grants from the National Science Foundation, the U.S. Department of Energy, and various private industry entities. His research has primarily been in the areas of high-temperature fuel cell membranes, polymer synthesis, conducting polymers, and liquid crystalline polymers and thermosets.

- ★ Held positions as a research scientist at Celanese Research Company, as a senior scientist at Johnson & Johnson, and as a section leader and deputy group leader at Los Alamos National Laboratory.
- ★ Served as director of the New York State Center for Polymer Synthesis and professor of Chemistry at Rensselaer Polytechnic Institute.
- ★ B.S. from the University of Florida, Ph.D. in Chemistry from the University of Connecticut.

★ DR. MARC CHIMOWITZ

COUNTESS ALICIA PAOLOZZI CoEE ENDOWED CHAIR IN NEUROSCIENCE
AT THE MEDICAL UNIVERSITY OF SOUTH CAROLINA

Seeking new treatments to prevent stroke

Dr. Chimowitz is seeking treatments to prevent stroke caused by narrowing of brain arteries, a field of research that is especially relevant in South Carolina, which has one of the nation's highest mortality rates from stroke. Dr. Chimowitz has received funding from the National Institutes of Health for a \$25 million multi-site clinical trial involving patients at more than 50 sites across the country. The trial will study the value of using stents to prevent strokes in patients whose brain arteries have hardened and narrowed due to plaque buildup (atherosclerotic stenosis). Dr. Chimowitz will lead the trial from MUSC.

- ★ Completed a \$14 million clinical trial to determine the effectiveness of warfarin versus aspirin for preventing stroke in patients with narrowed brain arteries.
- ★ Received a Career Investigator Award from the National Institute of Neurological Disorders and Stroke to mentor junior faculty members toward clinical research careers.
- ★ Was a professor in the department of neurology at Emory University.
- ★ B.Sc. in Mathematics and B.Sc. in Applied Mathematics from the University of Cape Town, M.B. and Ch.B. from the University of Cape Town School of Medicine (South Africa).



★ DR. TODD HUBING

MICHELIN ENDOWED CHAIR IN VEHICULAR ELECTRONIC SYSTEMS INTEGRATION AT CLEMSON UNIVERSITY

Powering discoveries that lead to safer, better automobiles

Today's automobiles, trucks, trains, and planes depend on electronic systems to control virtually every aspect of vehicle operation. At CU-ICAR's Carrol A. Campbell Jr. Graduate Engineering Center, Dr. Hubing's research focuses on methods for integrating these systems to significantly improve vehicular safety, performance, and reliability. His research team also is developing more efficient methods for distributing electric power in automobiles to allow hybrid and electric-powered cars of the future to be lighter, more powerful, and more energy efficient.

- ★ Chaired the 2008 Institute of Electrical and Electronics Engineers (IEEE) Advances in Automotive Electromagnetic Compatibility Test and Design Conference at the Clemson University International Center for Automotive Research (CU-ICAR).
- ★ Fellow of the IEEE and a past-president of the IEEE Electromagnetic Compatibility Society.
- ★ Held a professorship in Electrical and Computer Engineering at the University of Missouri-Rolla.
- ★ B.S. in Electrical Engineering from Massachusetts Institute of Technology, M.S. in Electrical Engineering from Purdue University, Ph.D. from North Carolina State University.



★ DR. THOMAS KURFESS

BMW ENDOWED CHAIR IN MANUFACTURING AT CLEMSON UNIVERSITY

Leading South Carolina's charge to become the premier automotive research and educational center

Dr. Kurfess focuses his research on precision systems, controls, automation, and robotics. The results of his work are currently being used in a variety of manufacturing environments, helping U.S. companies compete in the global market. In addition to automotive-related research, Kurfess is also preparing the next generation of engineers to work in the complex systems and global environment of today's automotive industry. Kurfess also serves as the director of the Carroll A. Campbell Jr. Graduate Engineering Center on the Clemson University International Center for Automotive Research (CU-ICAR) campus.

- ★ Served as special consultant of the United Nations to the government of Malaysia in the areas of applied mechatronics and manufacturing.
- ★ Held faculty positions at Carnegie Mellon University and the Georgia Institute of Technology.
- ★ Received numerous honors and awards including the Association for Manufacturing Technology's Charles F. Carter, Jr. Advanced Manufacturing Award.
- ★ Fellow of both the Society of Manufacturing Engineers and the American Society of Mechanical Engineers.
- ★ B.S. in Mechanical Engineering, M.S. in Mechanical Engineering, M.S. in Electrical Engineering and Computer Science, Ph.D. in Mechanical Engineering from Massachusetts Institute of Technology.



★ DR. JOHN J. LEMASTERS

CoEE ENDOWED CHAIR IN ADVANCED TECHNOLOGIES AT THE MEDICAL UNIVERSITY OF SOUTH CAROLINA

Cell visionary

Dr. Lemasters is a pioneer of techniques that allow scientists to see what happens inside an individual cell during reoxygenation—the restoration of oxygen to an organ following oxygen deprivation, which sometimes occurs following a heart attack or stroke. The process of redistributing oxygen to an organ can be stressful on tissue, leading to possible trauma and even cell death. Dr. Lemasters specializes in a kind of microscopy that allows scientists to view slices of an individual cell, much like the way CAT or MRI scans allow doctors to view the body in sectional layers. Other applications for Dr. Lemasters' work include understanding the mechanisms through which the liver is injured by chronic alcohol use and donated organs are damaged while being held for transplant surgery.

- ★ Holds five patents in confocal microscopy, organ preservation for transplantation, and related areas.
- ★ Served as director of the University of North Carolina's Cell and Molecular Imaging Facility.

★ B.A. in Psychology from Yale University, M.D. and Ph.D. in Cell Biology and Anatomy from Johns Hopkins University.



★ DR. MARTIN MORAD

BLUECROSS BLUESHIELD OF SOUTH CAROLINA FOUNDATION ENDOWED CHAIR IN CARDIOVASCULAR HEALTH
AT THE UNIVERSITY OF SOUTH CAROLINA

Pioneering new methods to treat congestive heart failure

Dr. Morad is an internationally recognized scientist in the field of cardiac electrophysiology and calcium signaling, specifically in the area of calcium-binding proteins. There are 40,000 proteins that work as a complex system in cardiac muscle. These proteins tell the heart how to contract and how fast; they also control how heart muscle grows and regenerates. Calcium acts as a signaling mechanism in the function of these proteins. Dr. Morad seeks to discover what causes these calcium signaling mechanisms to stop working properly, which can result in congestive heart failure. His work could lead to new drugs and procedures to treat congestive heart failure and other conditions.

- ★ Has maintained National Institutes of Health funding for 34 years.
- ★ Holds two U.S. patents.
- ★ Is a founding fellow of the International Society of Heart Research.
- ★ Is working on first tissue-derived human heart pacemaker.
- ★ Has maintained a lab at Mount Desert Biological Labs in Maine for 35 years where he has done important work on preventing arrhythmias associated with cardiac failure.
- ★ B.A. from Lake Forest College, Ph.D. in Physiology from the State University of New York.





★ DR. PAUL MORGAN

CoEE ENDOWED CHAIR IN BRAIN IMAGING AT THE MEDICAL UNIVERSITY OF SOUTH CAROLINA

Using MRI technology to battle debilitating diseases

Dr. Morgan is an established innovator in the applications of Magnetic Resonance Imaging (MRI), especially related to the quantification of microscopic diffusion of water in tissues as a sensitive measure of subtle brain damage. At MUSC he leads a team of scientists dedicated to translational medical research—applying advanced MRI techniques to better understand both the development of various neurological diseases and the effect of new treatments. Areas of focus include neurodegenerative diseases such as Alzheimer’s disease and Parkinson’s disease, with a particular interest in sensitive measures of patients with psychological problems, multiple sclerosis, and traumatic brain injury. Morgan has also spent considerable time using MRI to assess stroke patients and children with brain tumors. His appointment as director of the Center for Advanced Imaging Research, which recently received a state-of-the-art 3T MRI scanner from Siemens Medical, will create many opportunities for facilitating translational medical research involving MRI. Findings could potentially lead to commercial developments in a number of industries, including medical device manufacturing and image analysis software technology.

★ Served as associate professor at the University of Nottingham, Nottingham, U.K.

★ Holds degrees from the University of Kent at Canterbury, University College of London, and University of Nottingham (U.K.).

★ DR. JAY MOSKOWITZ

CoEE ENDOWED CHAIR IN CLINICAL AND TRANSLATIONAL RESEARCH AT THE UNIVERSITY OF SOUTH CAROLINA

Increasing medical information sharing to improve patient care

Dr. Moskowitz is working to bring together healthcare systems, providers, and researchers to enhance patient care through clinical trials and interchange of electronic patient records. By increasing medical information sharing in the state, first responders and medical teams will have instant access to an individual's medical history. Dr. Moskowitz is recognized as a leader in biomedical research and research policy administration with more than 35 years of experience in federal government, academic medicine, and research.

- ★ Serves as president and CEO of Health Sciences South Carolina, the statewide health sciences collaborative.
- ★ Served as deputy director for science policy and technology transfer, as well as principal deputy director, at the National Institutes of Health.
- ★ Was the founding director of the National Institute on Deafness and Other Communication Disorders.
- ★ B.S. from Queens College, B.S. from City University of New York Graduate School, Ph.D. in Biomedical Science from Brown University.





★ DR. KENNETH REIFSNIDER

CoEE ENDOWED CHAIR IN SOLID OXIDE FUEL CELLS AT THE UNIVERSITY OF SOUTH CAROLINA

Making powerful inroads into future fuels

Dr. Reifsnider's research is in the field of mechanical engineering, with a focus on the way that materials behave—their durability, damage tolerance, and the way they perform over time. His particular interest is in fuel cell science and engineering—creating practical and marketable fuel cells and systems that can meet future energy needs and benefit society. Fuel cells are continually replenished with fuel and thus provide a continuous supply of electric power without running down like a battery. One type of fuel cell—solid oxide—converts chemical energy directly into electrical energy. Applications for these fuel cells include large-scale power distribution for municipalities, rural areas, and industries, as well as heat and power for homes. They could also provide mobile power for computers, cell phones, and other electronics. Solid oxide fuel cells are highly efficient; operate with a number of fuels, including renewable fuels; and produce very low amounts of greenhouse gasses and pollution.

- ★ Only member of the National Academy of Engineering presently working in South Carolina.
- ★ Directs USC's Solid Oxide Fuel Cell Program.
- ★ Holds three patents.
- ★ Founded the *International Journal of Fuel Cell Science and Technology*.
- ★ Founded the Virginia Tech Center for Composite Materials and Structures.
- ★ Directed the Connecticut Global Fuel Center at the University of Connecticut.
- ★ B.A. in Mathematics from Western Maryland College; B.S. in Engineering Sciences, M.S. in Mechanics and Ph.D. in Metallurgy and Solid Mechanics from Johns Hopkins University.

★ DR. IAIN SANDERSON

CoEE ENDOWED CHAIR IN MEDICAL INFORMATICS AT THE MEDICAL UNIVERSITY OF SOUTH CAROLINA

Improving healthcare quality through medical information sharing

Dr. Sanderson leads initiatives in medical informatics across the state's four largest healthcare delivery systems and three research universities. The goal of his work is improving the quality of healthcare in South Carolina by creating secure databases for medical records that make it easier for multiple healthcare systems to share vital information that is relevant for clinical trials and research.

- ★ Developed a software portal, ORview, which is used more than 2 million times a year by staff throughout the Duke hospitals to process information. ORview won the ComputerWorld Honor Program's 21st Century Achievement Award for Medicine in 2006.
- ★ Serves as chief medical information officer for Health Sciences South Carolina.
- ★ Served as associate chief information officer (perioperative systems) for Duke University Health System.
- ★ B.A. and M.A. in Physiological Sciences for Medicine from Oxford University, B.M. and B.C.H. in Clinical Medicine from Oxford University Medical School.





★ DR. JOHN J. SCHAEFER

LEWIS BLACKMAN ENDOWED CHAIR FOR PATIENT SIMULATION AND RESEARCH
AT THE MEDICAL UNIVERSITY OF SOUTH CAROLINA

Leading the charge for increased patient safety

Dr. Schaefer is an international expert in healthcare simulation who is working to reduce patient injury and improve medical outcomes. In South Carolina, he is developing training, equipment, and software programs that will make South Carolina a leader in the medical simulation field. One important aspect of Schaefer's work is his development of a collaborative network of medical simulation centers across South Carolina. These centers are widely used to train physicians, nurses, and students. They include machines that simulate heart attacks, births, emergency room traumas, and more. The simulation centers allow healthcare providers to practice their skills in a controlled, risk-free environment, rather than in an actual patient setting. The use of this innovative training method results in better healthcare outcomes and increased patient safety.

- ★ Co-holds patents for the most successful mannequin-based human simulators on the market; was involved in developing the recently released, next-generation infant simulators.
- ★ Is developing a network of healthcare simulation centers across South Carolina that will put the state at the forefront of healthcare simulation internationally.
- ★ Helped establish the first mannequin-based simulation training center (University of Pittsburgh), the largest and most active of its kind in the world.
- ★ B.A. in Chemistry, B.S. in Chemical Engineering, and M.D. from West Virginia University.

★ DR. CHARLES SMITH

CHARLES AND CAROL COOPER ENDOWED CHAIR IN PHARMACY AT THE MEDICAL UNIVERSITY OF SOUTH CAROLINA

Cancer drug discovery champion

Dr. Smith works to design new drugs to fight cancer by unlocking molecular mechanisms important for tumor growth. This research could also enable the development of new drugs to fight a variety of inflammatory diseases, including arthritis, Crohn's disease, and diabetic retinopathy. Under Smith's leadership, MUSC's Center for Drug Discovery has investigated additional conditions including pain, liver injury, and stroke. Working in collaboration with other Center researchers, he has identified a new target in cancer cells. Smith's research could be integral to the growth of South Carolina's life sciences industry. From research largely funded by the National Institutes of Health, Smith holds nine patents in his field.

- ★ Serves as director of MUSC's Drug Discovery Core.
- ★ Former faculty positions at Duke and Penn State universities and the Fox Chase Cancer Center.
- ★ Founded Apogee Biotechnology Corporation.
- ★ B.S. and Ph.D. in Biochemistry from Michigan State University.





★ DR. RICHARD SWAJA

CoEE ENDOWED CHAIR IN REGENERATIVE MEDICINE AT THE MEDICAL UNIVERSITY OF SOUTH CAROLINA

Veteran researcher in regenerative medicine and bioengineering

Dr. Swaja's work is focused on regenerative medicine—the application of tissue engineering principles to restore the structure and function of damaged tissues and organs. The goal of this work is to advance current medical practice by enabling (1) in vivo (inside the body) regeneration of damaged tissues to return them to full functionality and (2) in vitro production of tissue for transplantation when regeneration is not possible. Dr. Swaja is also working to build South Carolina's bioengineering capabilities by developing statewide research, education, and economic development programs that bridge the physical and life sciences and increasing technology transfer between research institutions and industry.

- ★ Serves as director of the South Carolina Bioengineering Alliance—a collaborative effort among South Carolina's three research universities.
- ★ Served as senior advisor for bioengineering in the Office of the Director at the National Institutes of Health and for the National Institute of Biomedical Imaging and Bioengineering.
- ★ Member of the board of directors and chair of the Advocacy Committee for the American Institute of Medical and Biological Engineering.
- ★ Managed programs and conducted research at the Oak Ridge National Laboratory in areas involving genomics and proteomics, systems biology, biokinetic and metabolic modeling, nuclear medicine, radiobiology, and biophotonics.
- ★ Served as biosciences consultant and U.S. representative to several national and international scientific committees and foreign nations.
- ★ B.S. in Physics from Carnegie Institute of Technology, M.S. in Physics from University of Pittsburgh, Ph.D. in Nuclear Science from Carnegie Mellon University.

★ DR. KENNETH TEW

JOHN C. WEST ENDOWED CHAIR IN CANCER RESEARCH AT THE MEDICAL UNIVERSITY OF SOUTH CAROLINA

Pioneering an understanding of new cancer drugs

Dr. Tew is an international leader in cancer drug discovery and development. His earlier research was pivotal in the design of treatments for hormone refractory prostate cancer. More recently his research has been instrumental in the late-stage clinical testing of three novel drugs; one shows promise in treating ovarian and lung cancer, and another has potential as a modifier of bone marrow mediated immune function. Tew is also working to understand how cancer cells develop resistance to different drugs. As part of that work, discoveries have suggested links between cancer and Alzheimer's; the creation of a new knockout mouse (genetically engineered with one or more inoperable genes) may provide a useful model for studying these diseases.

- ★ Previous posts at Georgetown University, the Fox Chase Center in Philadelphia, and the University of Pennsylvania.
- ★ Awarded a National Cancer Institute Outstanding Investigator Grant and an American Cancer Research Society Scientific Excellence Award.
- ★ Fellow of American Association for the Advancement of Science.
- ★ Active on scientific advisory boards of a number of pharmaceutical companies.
- ★ B.S. in Microbiology/Genetics from the University of Wales, Ph.D. in Biochemical Pharmacology from the University of London Institute for Cancer Research.





★ DR. MELANIE THOMAS

GRACE E. DeWOLFF ENDOWED CHAIR IN MEDICAL ONCOLOGY AT THE MEDICAL UNIVERSITY OF SOUTH CAROLINA

Developing new screenings and treatments for gastrointestinal cancers

Dr. Thomas is a leading expert on gastrointestinal (GI) cancers. Gastrointestinal cancers include those of the stomach, liver, pancreas, colon, and elsewhere in the GI tract. Research within this CoEE will include searching for new targets (proteins that play a role in the disease process and are the intended sites of drug activity) for GI cancer treatment and identifying new ways to screen for GI cancer. At MUSC, Thomas is developing a clinical trials program for liver cancer and works with others to develop a robust research portfolio and clinical trials in other GI cancers within the CoEE. Currently, she is the principal investigator for 17 clinical trials, several of which are international.

★ Served as assistant professor in the Department of Gastrointestinal Medical Oncology at the M. D. Anderson Cancer Center at the University of Texas.

★ B.A. in Biology from Boston College, M.S. in Engineering from Harvard University, M.D. from Boston University School of Medicine.

★ DR. PAUL VENHOVENS

BMW ENDOWED CHAIR IN SYSTEMS INTEGRATION AT CLEMSON UNIVERSITY

Making vehicles safer and more efficient

Dr. Venhovens is a leader in the field of automotive systems integration; he brings both academic and industry perspectives to his role at the Clemson University International Center for Automotive Research (CU-ICAR). Venhovens' research focuses on the testing of vehicle systems and their components to ensure efficient and safe operation. His research addresses the increasingly complex needs of the worldwide automotive industry as a growing number of sophisticated electronic and mechanical systems must be smoothly integrated to create the cars of today and tomorrow.

- ★ Previously worked at BMW's research and development headquarters in Munich, Germany.
- ★ At BMW, served as leader for functional concept design for the 1 and 3 series with responsibility for functional design and integration of vehicle safety, NVH (noise/vibration/harshness), durability, performance, fuel economy, and vehicle dynamics.
- ★ Supervised research projects in Driver Assistance Systems and software engineering at Stanford University, the University of Michigan Transportation Research Institute, and the University of California-Berkeley.
- ★ B.S. from Norbertus College, M.S. and Ph.D. in Mechanical Engineering from Delft University of Technology (the Netherlands).



★ DR. RICHARD A. WEBB

CoEE ENDOWED CHAIR IN NANOELECTRONICS AT THE UNIVERSITY OF SOUTH CAROLINA

Developing the electronics of the future

At the University of South Carolina, Dr. Webb is researching new quantum devices for use in computer electronics and information technology. Webb's scientific accomplishments include fabricating some of the world's smallest electronic circuits, which could open the door to smaller, higher-performing electronic devices. Current products based on his discoveries include sensors to diagnose heart problems and monitor internal faults in metal structures, as well as military applications. Part of Webb's work includes harnessing the spin of electrons—an important key to developing new low-power devices for all future electronic applications.

- ★ Member of the prestigious National Academy of Sciences.
- ★ Fellow of the American Academy of Arts and Sciences.
- ★ Was a Distinguished University Professor at the University of Maryland and held the Alford Ward Chair of Semiconductor Physics.
- ★ Received the American Physical Society's Buckley Prize and the Simon Memorial Prize from Oxford University.
- ★ B.A. from the University of California at Berkeley, M.S. and Ph.D. from the University of California at San Diego.



★ DR. JOHN ZIEGERT

TIMKEN CHAIR IN AUTOMOTIVE DESIGN AND DEVELOPMENT AT CLEMSON UNIVERSITY

Leading electro-mechanical systems designer

Dr. Ziegert is helping automotive companies be more competitive by improving the precision of their components and processes. Ziegert's research is focused on designing instruments and machines for use in high-precision measurement and manufacturing. At the Clemson University International Center for Automotive Research (CU-ICAR), Ziegert and his team are developing friction management and power transmission solutions to improve vehicle reliability and performance and reduce vehicle weight.

- ★ Held academic appointments at the University of Florida, the University of Hawaii, Brown University, Roger Williams University, the University of Rhode Island, and the California Institute of Technology.
- ★ Holds three patents, with five more pending.
- ★ Past-president of the American Society for Precision Engineering.
- ★ B.S. from Purdue University, M.S. in Mechanical Engineering from Northwestern University, Ph.D. in Mechanical Engineering from the University of Rhode Island.



CoEE REVIEW BOARD MEMBERS



Paula Harper Bethea
Chair

Appointed by
Speaker of the House



Pamela P. Lackey
Vice Chair

Appointed by
President Pro Tempore of the Senate



Robert W. Pearce, Jr.
Secretary

Appointed by
Speaker of the House



J. Lyles Glenn

Appointed by
Governor



Melvin C. Williams

Appointed by
President Pro Tempore
of the Senate



Patricia E. Wilson

**Appointed by
Speaker of the House**



Robert "Bobby" Hitt III

**Appointed by Chairman
of the House Ways and Means
Committee**



Regan Voit

**Appointed by Chairman
of the Senate Finance
Committee**



Keith D. Munson

**Appointed by
Governor**



Charlie Condon

**Appointed by
Governor**

SOUTH CAROLINA'S RESEARCH UNIVERSITIES







NEW CAROLINA
SOUTH CAROLINA'S COUNCIL ON COMPETITIVENESS

We gratefully acknowledge New Carolina—SC's Council on Competitiveness—for its support of the CoEE Program and this publication. We applaud New Carolina's vital work to raise per capita income and strengthen South Carolina's economy.