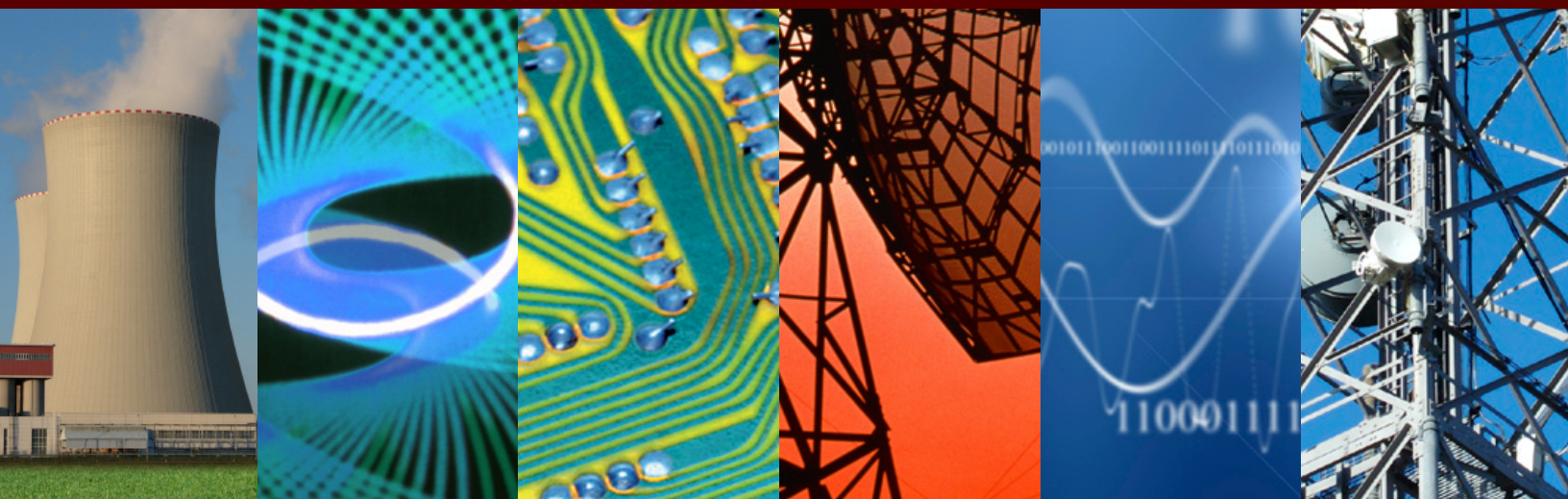


SCHOOL OF  
**Electrical, Computer and Energy Engineering**



## Organizational Structure for Ira A. Fulton Schools of Engineering

Schools (Director)	Lead These Engineering Undergraduate Degree Programs	Coordinate Across Engineering for These Grand Challenge Areas...
<b>Biological &amp; Health Systems Engineering</b> (William Ditto)	Bioengineering	<b>Health Care</b> - treatments and cures for human diseases and dysfunctions, re-engineering of biological systems and human physiology
<b>Sustainable Engineering &amp; The Built Environment</b> (Paul Westerhoff)	Civil and Environmental Engineering Construction Management Environmental concentration Construction concentration Sustainable Engineering Concentration Construction Engineering	<b>Sustainable Engineering</b> – advance theory and practice of sustainable engineering; provide access to clean water and clean air; restore and improve urban infrastructure.
<b>Computing, Informatics &amp; Decision Systems Engineering</b> (Ron Askin)	Computer Science Computer Systems Engineering Industrial Engineering Informatics (across all majors)	<b>Secure Cyberspace</b> <b>Health Care Delivery Systems</b> – information, diagnostics, healthcare policy
<b>Electrical, Computer &amp; Energy Engineering</b> (Stephen Phillips)	Electrical Engineering Nuclear Engineering certificate Electric Power/Energy concentration Arts, Media and Engineering concentration	<b>Energy</b> – generation, storage, transmission and distribution <b>Security and Exploration</b> – control, communication and identification
<b>Engineering of Matter, Transport, and Energy</b> (Kyle Squires)	Aerospace Engineering Chemical Engineering Materials Science & Engineering Mechanical Engineering Aeronautics concentration Astronautics concentration Computational and Mathematical Mechanics concentration Energy and Environment concentration Engineering Education concentration Materials Engineering minor	<b>Security and Exploration</b> – securing cyberspace, communications, monitoring threats, developing “self-healing systems,” exploring inaccessible regions



**IRA A. FULTON SCHOOLS OF  
ENGINEERING**

**Engineering Development**  
P.O. Box 875506  
Tempe, AZ 85287-5506

For more information about ASU, the  
Ira A. Fulton Schools of Engineering,  
or the School of Electrical, Computer  
and Energy Engineering (ECEE),  
please visit us online at  
<http://engineering.asu.edu/ecee>

**School of Electrical,  
Computer and Energy  
Engineering (ECEE)  
Annual Report  
2008 – 2009**

This publication is written, designed,  
and produced by the Ira A. Fulton  
Schools of Engineering for distribution  
to selected alumni, industry partners,  
and academic friends worldwide.

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- Tao named Director for Center for Bioelectronics and Biosensors
- Zhang awarded \$1.5 million AFRL grant
- Bakkaloglu is named 'exemplar'
- Chae wins NSF CAREER
- Cao receives Outstanding New Faculty Award
- Best Tutorial Paper Award
- New books by faculty
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## School of Electrical, Computer and Energy Engineering (ECEE)



Stephen M. Phillips

### Message from the ECEE Director

Changes and challenges have been pervasive themes for the past year, for our national leadership, for the global economy, and for many universities, including ASU. Our significant change and challenge for this year has been embedding the Engineering academic programs at ASU into five new schools, in contrast to the previous ten departments that comprised the school. (See inside front cover for new organizational chart.)

We have certainly seen administrative efficiencies gained by reducing the number of units and by pushing more responsibility and authority down to the individual schools, but the main drivers of this reorganization are to recognize the interdisciplinary nature of current engineering practice and to emphasize the schools' cross-disciplinary research and academic programs. The reorganization of the schools of engineering has resulted in the launch of an aggressive faculty recruitment effort, focused on faculty for interdisciplinary engineering challenges.

“ Our undergraduate and graduate enrollment numbers remain strong, and the outstanding achievements and accolades earned by our faculty, staff and students continue to grow. ”

The new name for our unit, the School of Electrical, Computer and Energy Engineering (ECEE), reflects the strength of our academic and research programs in the areas of Computer Engineering and Energy Engineering that have been led by our Electrical Engineering degree program faculty for many years. The Electric Power and Energy Systems group involves ten faculty, including three members of the National Academy of Engineering. Our photovoltaics research is a vertically integrated effort, ranging from fundamental materials to power electronics to the impacts of distributed generation on the grid. Our VLSI design, modeling and predictive technologies efforts are internationally recognized, and our computer networking efforts include faculty and students engaged in hardware and signal processing for sensor networks, protocols for computer network communications and information theoretic approaches to system architectures and design.

With changes in name and structure, come renewed efforts to strengthen our commitment to excellence in teaching, research and service to the field. Our undergraduate and graduate enrollment numbers remain strong, and the outstanding achievements and accolades earned by our faculty, staff and students continue to grow. This annual report serves as testimony to our productivity and exceptional accomplishments in the face of changes and challenges.



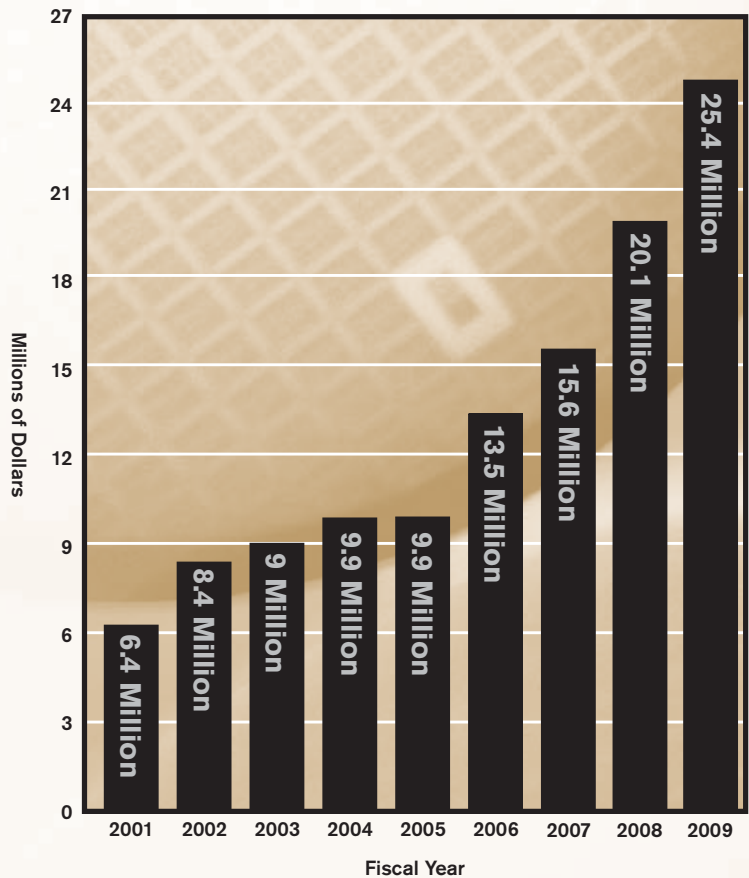
Stephen M. Phillips, Ph.D., P.E.  
 Professor of Electrical Engineering  
 Director, School of Electrical, Computer  
 and Energy Engineering

## FACULTY HONORS

<b>NAE Members</b>	<b>3</b>
<b>IEEE or APS Fellows</b>	<b>17</b>
<b>NSF CAREER and NIH – YIP awardees</b>	<b>10</b>
<b>DoD/ONR – YIP</b>	<b>5</b>

## FINANCIAL SUMMARY

### School of Electrical, Computer and Energy Engineering Sponsored Research Expenditures



# year in review

## Schroder Named Regents' Professor



Professor **Dieter K. Schroder**, was recognized with the distinction of ASU Regents' Professor, the university's highest faculty honor. The recognition acknowledges Schroder's pioneering contribution in his field of expertise and his sustained professional distinction at the national and international level.

Internationally recognized in the field of semiconductor devices, Schroder has performed seminal research in semiconductor materials and device characterization, including electrical/lifetime measurements, low power electronics, device modeling and metal-oxide-silicon devices. A dedicated teacher and mentor, Schroder has taught more than 80 classes at ASU since 1981.

## NIH Grant for Innovative Research



Professor **Rudy Diaz** was awarded a \$1.2 million National Institutes of Health (NIH) grant as part of the EUREKA (Exceptional, Unconventional Research Enabling Knowledge Acceleration) program. One of 38 projects to be selected, Diaz's work aims

to gain novel insights into the pathological obstructions of neural signals and the development of new and more precise neural-stimulation technology. The project involves the assembly of nanomachines and their interaction with the human body at the cellular level, a technology that will be useful in detecting and treating a variety of human neurological disorders.

## ECEE Professor Appointed Center Director



Professor **Nongjian (N.J.) Tao** was recently appointed Director of the Center for Bioelectronics and Biosensors in Arizona State University's Biodesign Institute. Tao is a professor of electrical engineering, an affiliated professor of chemistry and biochemistry, and a researcher in the Center for Solid State Electronics Research. The Center for Bioelectronics and Biosensors develops advanced sensors for reliable and quick detection of trace chemicals and bio-molecules to improve healthcare, environmental safety, pollution, sustainability, and national security. Tao holds five U.S. patents, has published 160 refereed journal articles and book chapters and has given over 150 invited talks and seminars worldwide.

## Chae Wins NSF – CAREER Award



Professor **Junseok Chae** was a recipient of the National Science Foundation Faculty Early Career (CAREER) Award for 2009. One of NSF's most prestigious awards for junior faculty, the CAREER award is highly competitive and recognizes leadership potential in recipients for advancing research and education in their areas of expertise. Chae's

focus is on microelectromechanical systems (MEMs) with an emphasis on biosensors, bio-MEMs, and MEMs for hearing aids. His CAREER project will tackle fundamental questions in the use of molecular probes for biosensors.

## Cao Wins SIGDA Award



Professor **Yu (Kevin) Cao** won the Association for Computing Machinery's Special Interest Group on Design Automation (SIGDA) national award for outstanding new faculty. The award is given to a junior faculty member early in his/her academic career who

demonstrates outstanding potential as an educator and/or researcher in the field of electronic design automation. Cao was cited for his research on the predictive technology model, as well as work on device and circuit reliability. The award provides \$1,000 and a citation presented to Cao at the 2009 Design Automation Conference.

## AFRL Grant for Solar Cell Research

A \$1.5 million contract from the Air Force Research Laboratory (AFRL) Space Vehicles Directorate, awarded to Professor **Yong-Hang Zhang**, will fund research on high-efficiency solar cells. Zhang is a



professor of electrical engineering and director of ASU's Center for Nanophotonics. The AFRL project is based on innovative technologies by Zhang's research group in high-efficiency solar cells and aims to drastically reduce the weight of solar panels for future satellites and other space vehicles. An important additional application of this research is concentrator photovoltaics for industrial electricity generation to improve operational costs and environmental impact.

## Bakkaloglu Receives ASU "Rising Star" Recognition

Professor **Bertan Bakkaloglu** was among six ASU faculty designated as "rising stars" by ASU President Michael Crow in 2008. Bakkaloglu was recognized for being a leader among the finest teacher-scholars the university has to offer. He was cited for his exceptional teaching and research capabilities. Bakkaloglu, an associate professor of electrical engineering, joined ASU in 2004 after nine years at Texas Instruments Inc. where he worked in advanced integrated circuit development. His teaching and research since then has involved a broad range of cross-disciplinary and application-driven efforts in the area of analog and mixed signal IC design and microelectronic circuits and systems.



# year in review

## Staff Awards

**Stacy Esposito** received the Ira A. Fulton Schools of Engineering Excellence Award for her hard work and dedication in the area of sponsored-research activities. An assistant director for research advancement, Stacy supervises sponsored projects, proposals/awards processing and accounting in ECEE. Stacy was cited for her tireless efforts to ensure the processing of proposals and awards and for her outstanding team-building skills that have helped to strengthen communication across all levels of administration.

**Darleen Mandt**, an ECEE student services coordinator, earned an IMPACT Award for Performance from the Ira A. Fulton Schools of Engineering. Darleen was recognized for her exceptional skills in coordinating and managing the huge volume of new graduate student applications that ECEE receives every year. Darleen is the principal contact for prospective, admitted and graduated electrical engineering grad students. She was instrumental in producing an ECEE grad student database to capture critical information not otherwise available through the university's system.

**Phouney Lopez**, an ECEE staff member in the main office, was a recipient of ASU's Top Multiple SUN Award. This award provides the opportunity to give specific and immediate recognition to department staff for demonstrations of individual excellence. Phouney was one of four employees honored with this award at the President's Recognition Reception.

## ECEE Faculty Earn Top 5% of Teaching Recognition

Three EE faculty members were recognized for excellence as determined by teaching evaluations across the Ira A. Fulton Schools of Engineering. Professor **James Aberle**, Professor **David Allee** and Professor **Tolga Duman** were in the top 5% of instructors who received excellent teaching evaluations and were noteworthy for their contributions to the rich educational experiences of their students.

## Recent Hires

**George Maracas**, Research Professor, PhD, Cornell University; Research interests: Photovoltaics and photonics.

**Sule Ozev**, Associate Professor, PhD, University of California, San Diego; Research interests: Low-cost test approaches for integrated RF wireless circuits, process variability analysis and test development for analog circuits, path delay variability analysis and variability tolerant digital architectures.

**Christiana Honsberg**, Professor, PhD, University of Delaware; Research interests: photovoltaics, ultra-high efficiency solar cells and silicon solar cells.





## Reisslein and Students Win Best Tutorial Paper Award

A paper titled, "Ethernet Passive Optical Network Architectures and Dynamic Bandwidth Allocations Algorithms," by Professor **Martin Reisslein**, an electrical engineering associate professor, and two of his former students, **Michael McGarry** and **Martin Maier**, won the IEEE Communication Society's Best Tutorial Paper Award. The award is given to an outstanding tutorial paper published in any Communication Society magazine or journal in the year. The paper was recognized for its clarity, quality of presentation, timeliness and relevance.

## New Faculty Books

**Constantine Balanis**, ed., *Modern Antenna Handbook*, John Wiley & Sons, Inc., 2008.

**Richard G. Farmer** and P. M. Anderson, *Series Compensation of Power Systems*, China Electric Power Press, Beijing, China, 1996. Chinese Translations, 2008.

**David Frakes**, William Singhose, Jeff Donnell, *Introductory Biomechanical Design Tools*, Lulu Online Press, 2009.

**Lina J. Karam** and **Naji Mounsef**, *Introduction to Engineering: A Starter's Guide with Hands-On Digital Multimedia Explorations and Robotics*, Morgan-Claypool, 2008.

**Lina J. Karam** and **Naji Mounsef**, *Introduction to Engineering: A Starter's Guide with Hands-On Analog Multimedia Explorations*, Morgan-Claypool, 2008.

**Antonia Papandreou-Suppappola**, Sandeep P. Sira and Darryl Morrel, *Advances in Waveform-Agile Sensing for Tracking*, Series on Algorithms and Software, Morgan & Claypool Publishers, 2008.

**Gang Qian** and Y. Ma, eds., *Intelligent Video Surveillance: Systems and Technology*, Taylor and Francis CRC Press, January 2010.

**Dieter K. Schroder**, L. Fabry, R. Hockett, H. Shimizu and A. Diebold, eds., *Analytical and Diagnostic Techniques for Semiconductor Materials, Devices, and Processes 7*, ECS Transactions - Washington, DC, Volume 11, 2007.

**Daniel Tylavsky**, *Digital design for the laboratory: Hardware & Simulation (using LogicWorks 5)*, Ver 1, 5th ed., CenterPoint Publishing, 2009.

**Junshan Zhang** and Weiyan Ge, *Network Scheduling: Joint PHY and MAC Optimization for Wireless Scheduling*, Verlag Dr. Muller Publisher, 2009.

**J. Zhang** and Dong Zheng, *Physical-layer Aware Control and Optimization in Wireless Networks*, Verlag Dr. Muller Publisher, 2009.

# year in review

## ECEE Research Professors

**Richard Akis**, PhD, McMaster University in Hamilton, Ontario, Canada; Associate Professor Research: Quantum transport in mesoscopic semiconductor devices and quantum chaos in open systems connection between classical and quantum mechanics

**Stuart Bowden**, PhD, University of New South Wales; Associate Professor Research: Characterization of silicon materials for photovoltaic applications

**Hung Chang**, PhD, Purdue University; Assistant Professor Research: Biomedical devices, bio-instrumentation, nano-electro-mechanical systems (NEMS)

**Erica S. Forzani**, PhD, Cordoba National University – Argentina; Assistant Professor Research: Chemical- and bio-sensors

**Zoe Lacroix**, PhD, Computer Sciences, Université Paris XI (Orsay) – France; Associate Professor Research: Databases, bioinformatics, Web XML, ontology

**Denis Mamaluy**, PhD, B. Verkin Institute for Low Temperature Physics and Engineering; Assistant Professor Research: Quantum transport simulation in semiconductor nano-structures

**Jun Shen**, PhD, University of Notre Dame; Research Professor: Physics of organic LEDs, MEMS, novel logic, memory devices and circuits

**Bert Vermeire**, PhD, University of Arizona; Assistant Professor Research: Solid-state electronics

**Seth Wilk**, PhD, Arizona State University; Assistant Professor Research: Biosensors, ion channel proteins, silicon microfabrication

**Weimin Wu**, PhD, Arizona State University; Assistant Professor Research: Physics and modeling of semiconductor devices.

**Peiming Zhang**, PhD, Institute of Chemistry at the Chinese Academy of Sciences; Associate Professor Research: DNA electronics

## ECEE Affiliate Professors

**Alford, Terry**, PhD, Cornell University: Silver and copper metallization and low-k dielectrics for future integrated circuit (IC) technologies; advanced metallization for low-power electronics.

**Chatha, Karamvir**, PhD, University of Cincinnati: VLSI design and CAD; embedded systems design; system-level design; hardware-software cosynthesis; reconfigurable computing; high-level synthesis.

**Dey, Sandwip**, PhD, Alfred University: MOCVD and chemical processing science of electroceramics and contact metals.

**Gupta, Sandeep**, PhD, Ohio State University: Wireless networks; mobile and ubiquitous/pervasive computing; embedded sensor networks for biomedical applications.

**He, Jiping**, PhD, University of Maryland, College Park: Neural interface technologies for neuroprosthetics; rehabilitation robotics for stroke or spinal cord injury; learning and adaptation in neuromuscular control systems.

**Jung, Ranu**, PhD, Case Western Reserve University: Neural engineering.

**Morrell, Darryl**, PhD, Brigham Young University: Probability theory, decision theory, attentive sensors, target tracking, engineering pedagogy as a scholarly discipline.

**Newman, Nathan**, PhD, Stanford University: Semiconductor, superconductor and dielectric materials; thin film materials synthesis; materials characterization.

**Panchanathan, Sethuraman**, PhD, University of Ottawa: Multimedia computer and communications; haptic user interfaces; assistive and rehabilitative devices and technologies.

**Rivera, Daniel**, PhD, California Institute of Technology: Life cycle and hierarchical issues in process control system identification; robust process control.

**Vrudhula, Sarma**, PhD, University of Southern California: VLSI CAD for low power embedded systems and optimization statistical optimization for VLSI.

## ASU Quick Facts

ASU's research expenditures grew to \$218.5 million in the fiscal year that ended June 30, 2007—an increase of more than 300 percent since ASU became a Research 1 university in 1994.

ASU is at the forefront of American universities supporting student entrepreneurs, investing \$200,000 each year in seed funding through the Edson Student Entrepreneur Initiative.

ASU's Tempe campus has one of the nation's largest enrollments on a single campus at more than 52,000 students. ASU has a total of more than 67,000 at the four ASU campuses.

ASU awards 13,600 degrees annually, on pace with the nation's largest universities.

# doctoral graduates

## Summer 2008

**Wing-Yee Chu**, "Wide Bandwidth Low Ripple Supply Modulators for Polar Transmitters," B. Bakkaloglu, chair

**Nan Jiang**, "The Extraction, Restoration and Tracking of Image Features," J. Si, chair

**Prasanna Khare**, "Development of a Strained SiGe Channel PMOSFET Integrable in an Existing SiGe HBT Technology," D. Schroder, chair

**Ioannis Kyriakides**, "On the Use of Monte Carlo Techniques for Integrated Sensing and Processing," A. Papandreou-Suppappola, D. Morrell, co-chairs

**Ravishankar Rao**, "Fast and Accurate Techniques for Early Design Space Exploration and Dynamic Thermal Management of Multi-core Processors," S. Vrudhula, chair

**Qinghui Tang**, "Thermal Aware Scheduling in Environmentally Coupled Cyber-Physical Distributed Systems," S. Gupta, chair

**Tsing Wai Francis Tsow**, "Tuning Fork as a Sensor and Beyond," N. Tao, chair

**Jang Wang**, "Stress Effects on MOSFET," D. Schroder, chair

**Charles Zhan**, "System Identification for Robust Control," K. Tsakalis, chair

## Fall 2008

**Ashwin Ashok**, "Modeling Of Gallium Nitride High Electron Mobility Transistors," D. Vasileska, O. Hartin, co-chairs

**Daniel Alvarez**, "Characterization of Floating Gate Implantation Dose and Its Effect On Pmos Electrical Erasable Cell (Peec) Memory Arrays," D. Schroder, chair

**Kai Bai**, "Ultra-wideband Technology and Wireless Sensor Networks: Acquisition and Distributed Inference," C. Tepedelenioglu, chair

**Wenjian Chen**, "Design and Analysis of a Transformer Coupled CMOS Receiver Front End for High Frequency Applications," H. Barnaby, chair

**Xiao-Jie Chen**, "Characterization and Modeling of the Effects of Molecular Hydrogen on Radiation-Induced Defect Generation in Bipolar Device Oxides," H. Barnaby, chair

**Qinghai Gao**, "Cross-Layer Optimization and Cooperative Communications in Wireless Networks," J. Zhang, chair

**Liang Huang**, "Dynamics and Security Of Complex Clustered Network Systems," Y.-C. Lai, chair

**Zhiyong Huang**, "Mutual Coupling, Channel Model, and BER for Curvilinear Antenna Arrays," C. Balanis, chair

**Waleed Khalil**, "Analysis and Design of On-chip Phase Noise Measurement Modules," B. Bakkaloglu, chair

**Harish K Krishnamurthy**, "Control Strategies for a Universal Fully Modular Power Conversion Architecture," R. Ayyanar, chair

**William J. Lambert**, "Assessment and Improvement of Microprocessor Power Delivery Networks," R. Ayyanar, chair

**Karl C. Mohr**, "Radiation Hardened Memory Design," L. Clark, chair

**Jun Zhang**, "Waveform Diversity and Design for Agile Sensing and Environment Characterization," A. Papandreou-Suppappola, chair

**Wei Zhao**, "Predictive Technology Modeling for Scaled CMOS Design," C. Yu, chair

## Spring 2009

**Vikas Chaudhary**, "Low Power High Performance NAND Match Line Content Addressable Memory," L. Clark, chair

**Chih-Chieh Cheng**, "Programmable Aperture Antenna Using Monolithically Integrated Mems Switches," A. Abbaspour-Tamijani, chair

**Wei-Jung Chien**, "Rate-Distortion Based Adaptive Distributed Video Coding," L. Karam, chair

**Aron Cummings**, "The Spin Hall Effect in Quantum Wires," D. Ferry, chair

**Nicolas Faralli**, "Advanced Algorithmic Techniques for Cellular Monte Carlo Simulation," M. Saraniti, chair

**Hiva Hedayati**, "Wideband Frequency Synthesizers for Future Wireless Communication Systems," B. Bakkaloglu, chair

**Kivanc Inan**, "Analytic Continuation Methods for Reconstructing Electromagnetic Data," R. Díaz, chair

**Sang-Soo Je**, "Microdevices For Hearing Aid Applications," J. Chae, chair

**Himanshu Shah**, "Target Tracking and Sensor Scheduling in Sensor Networks," D. Morrell, chair

**Razib Shahriar Shishir**, "Room Temperature Transport in Graphene," D. Ferry, chair

**Rahul Shringarpure**, "Compact Modeling Of Amorphous Silicon Thin Film Transistors," L. Clark, chair

## Honors and Scholarships Undergraduate ECEE Students

**Merit Scholars: 11**

**Honors Students: 30**

**Scholarships (private/corporate): \$159,483**

**Per student average: \$3,189**

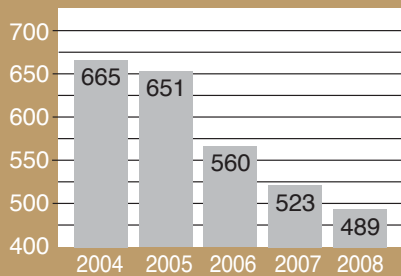
## Palais Award

Dr. **Liang Huang** was the recipient of the 2008-2009 Palais Doctoral Outstanding Student Award. Huang's dissertation, titled "Dynamics and Security of Complex Clustered Network Systems," investigated how dynamical properties are affected by clustered structures. Huang's results will be useful for optimizing or controlling information spread on social or biological networks. Huang's advisor was ECEE professor, Dr. Ying-Cheng Lai. Huang is currently working as a post-doctoral student with Lai.

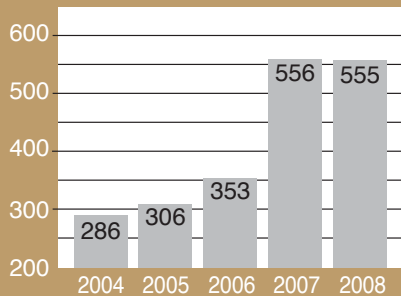


**ECEE  
ENROLLMENT  
INFORMATION**

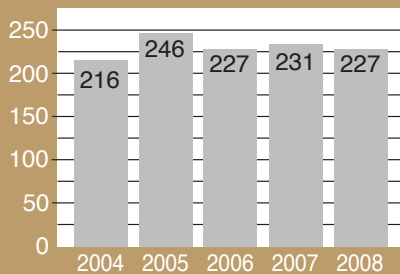
**BACHELOR'S ENROLLMENT**  
FALL SEMESTER



**MASTER'S ENROLLMENT**  
FALL SEMESTER



**PhD ENROLLMENT**  
FALL SEMESTER



**Graduate Student Honors and Awards**

Three ECEE teaching assistants were awarded the 2008-2009 Graduate and Professional Student Association (GPSA) Teaching Excellence Award. Selected from among the top 20 ASU teaching assistants at ASU, the awardees, **Lakshmi Ravichandran**, **Naji Mounsef**, and **Mahesh Banavar** were nominated by peers, students or a faculty member and were honored during a fall GPSA luncheon ceremony.

ECEE students, **Lloyd Breazeale** and **Adam Burke**, were recipients of a GPSA research grant. This competitive ASU award grants graduate students up to \$750 for independent research and up to \$2,000 for dissertation or thesis research.

**Ira A. Fulton Schools of Engineering  
Facts at a Glance**

**Degree Programs Offered**

- 11 Baccalaureate Degree Programs
- 14 Master's Degree Programs
- 11 Doctoral Degree Programs

**Enrollment**

- 4,253 Undergraduate
- 1,248 Master's
- 812 Doctoral

**Research Expenditures**

- Fiscal Year 2009
- \$66 million
- Faculty- More than 200
- Alumni- More than 30,000

## Graduate Fellowships

Achievement Rewards for College Scientists (ARCS):  
**Ben Green** and **Michael McLain**

Department of Defense SMART award:  
**Elizabeth Steenbergen**

Fulton Fellowship: **Craig Bush, Michael DiNezza, Stephen Herman, Michael Leright** and **John Sochacki**

NASA Graduate Student Researchers Program (GSRP):  
**Jeffrey Dickeson**

Raytheon: **Vicente Molieri**

University Graduate Fellowship: **Craig Bush, Cheng Chih-Chieh, Timothy Day, Weiyan Ge, Miao He, Yang Lei, Michael Leright, Feng Ma, Chenhui Niu, Dajun Qian, John Sochacki, Francis Tsow, Kai Tu** and **Feng Wang**

University Graduate Scholarship: **Aaron Williams**

Science Foundation Arizona (SFAz): **Michael DiNezza, Stephen Herman, Berkay Kanberoglu, Debin Li, Mark Reese, Donna Simon, Elizabeth Steenbergen, Shanshan Wang** and **Emre Yunus**

## Calling All Alumni...

Do you have a career update or favorite ASU memory that you'd like to share with your EE classmates?

ECEE has developed a conduit to connect with its alumni through *ECEE Connections*, a semiannual newsletter that features profiles of EE graduates, department news and research and faculty updates.

For our next newsletter, we would like to hear your story. Send your information to [askee@asu.edu](mailto:askee@asu.edu).

To read previous editions of the newsletter, visit <http://engineering.asu.edu/ecee/publications>

## ASU Quick Fact

ASU's 2007 freshman class included 148 National Merit Scholars, more than any public university in the Pac-10 conference.

## New Nuclear Power Engineering Certificate Program



Dr. Keith Holbert

**The demand for more electricity generation from cleaner energy sources has put nuclear power once again in the nation's spotlight. Based on recent estimates by the Nuclear Regulatory Commission (NRC), the energy industry is poised to apply for new construction and operation licenses for more than 30 nuclear power plants in the next two**

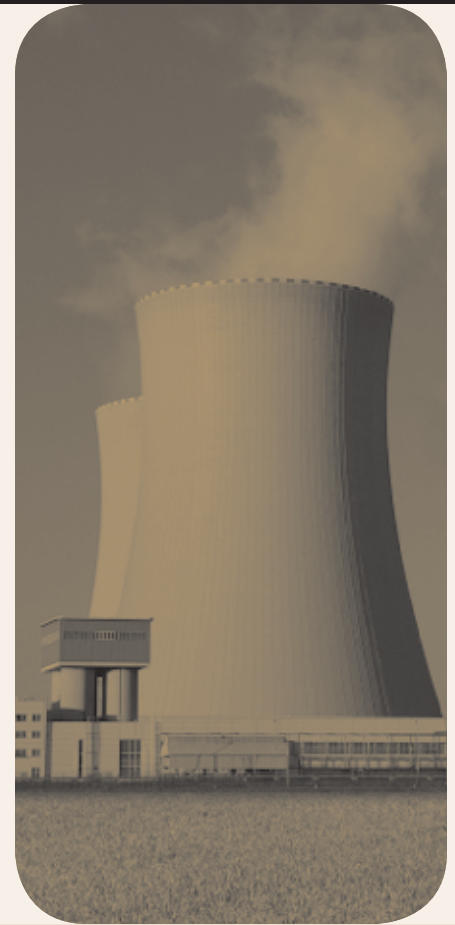
**years. In addition, the American Physical Society estimates that the industry may need to hire more than 500 workers nationwide each year in the near future with specific expertise in nuclear engineering—far more than the current number of new nuclear engineers graduating from college annually.**

In anticipation of accelerated numbers of engineering experts required for the field of nuclear power generation, ASU has launched a new graduate level program certificate in nuclear power generation. The program, which began in fall 2009, is directed by **Dr. Keith Holbert**, an associate professor of electrical engineering and a nuclear engineering expert.

"The majority of engineers working at, or in support of, nuclear plant operations, are not nuclear engineers, so higher education institutions need to offer programs that provide engineers and scientists in a variety of specialties more education in the fundamental concepts of nuclear energy and power plant operations," said Holbert.

The certificate program is designed to train chemical, electrical and mechanical engineers, as well as physicists, chemists and mathematicians to build on their expertise and become qualified for potential jobs necessary to manage and operate nuclear power generation facilities. The program offers a graduate certificate requiring 18 hours of course credit with courses made available online.

**For more information on this program, visit <http://www.asuengineeringonline.com/online/>**



*Based on recent estimates by the Nuclear Regulatory Commission (NRC), the energy industry is poised to apply for new construction and operation licenses for more than 30 nuclear power plants in the next two years.*



## Heydt Leads ASU Effort in NSF – ERC on Grid Architectures for Renewable Energy Integration



Dr. Gerald Heydt

A team of ECEE faculty members is part of an \$18.5 million National Science Foundation (NSF) engineering research center (ERC), focused on re-engineering the nation's power grid. The Future Renewable Electric Energy Delivery and Management (FREEDM) Systems Center is headquartered in North Carolina State University, and became one of the latest

**Gen-III ERCs established by NSF in 2008.**

**Dr. Gerald Heydt**, an ASU Regents' Professor, leads ASU's effort along with colleagues, Dr. Keith Holbert, Dr. George Karady, Dr. Raja Ayyanar and Dr. Dan Tylavsky in power systems engineering and Dr. Jay Golden from the ASU School of Sustainability.

The focus of FREEDM is to make the grid adaptable to renewable electric-energy technologies, such as solar and wind power, thereby transforming the nation's centralized grid into a "smart grid" to enable greater use of renewable energy sources. This involves building a new and sophisticated infrastructure that not only provides vastly more renewable energy generation, but also offers a variety of energy distribution options.

"We have to draw a blueprint for the kind of network needed to deliver and manage large-scale distributed renewable-energy resources," Heydt explains. For this, the team needs to develop "controls for power systems that can provide several routes for both delivering and redistributing power from clean-energy sources," he adds.

The technology will advance the development of plug-in hybrid vehicles, appliances and other devices that can both store energy and send it back to the power grid. Such systems have the potential to reduce the need for transmission lines, and will likely be able to operate with smaller generation stations than necessitated by current power systems.

FREEDM will draw from ECEE expertise in power systems engineering, particularly in the use of computers and semiconductors for operating power systems. The core universities for the ERC are NC State University, Arizona State University, Florida A&M University, Florida State University and Missouri University of Science and Technology. The core international universities are RWTH Aachen University in Germany and the Swiss Federal Institute of Technology in Switzerland.



*The focus of FREEDM is to make the grid adaptable to renewable electric-energy technologies, such as solar and wind power, thereby transforming the nation's centralized grid into a "smart grid" to enable greater use of renewable energy sources.*

# RESEARCH CENTERS

## WINTech: Wireless Integrated Nano-Technology Center

Director: **Bert Vermiere**

The focus of WINTech is the design and advancement of small, highly integrated electrical and electro-mechanical systems. WINTech has students and faculty from electrical, chemical, materials and bio-engineering as well as computer science and engineering.

WINTech's core technologies include self-autonomous fully independent systems, self-powered devices, ultra-low power consumption devices, embedded SOC software and hardware, adaptive materials and ad hoc network functional systems that operate in a large distributed fashion. Connection One is its NSF-funded IU/CRC.

Arizona State University is the lead university, partnering with the University of Arizona, the University of Hawaii, Rensselaer Polytechnic University and The Ohio State University. Industrial partners include Analog Devices, BAE Systems, Crystal IS, Freescale Semiconductor, General Dynamics C4 Systems, IBM, Intel, Kyocera, Motorola, Raytheon, Sensor Electronic Technology Inc., Space Micro, Texas Instruments, Timbre, Velox and Vixar.

### Highlights, 2008-2009:

- WINTech professors, **Junseok Chae** and **Bertan Bakkaloglu** received an award for cross-disciplinary semiconductor research for a project, titled "A Disposable Integrated CMOS Biosensor for Pre-screening of Cardiovascular Diseases." They will attempt to develop high-accuracy, high-speed and disposable detectors for biomarkers.

For more information, visit <http://wintech.asu.edu>



## Connection One: Integrated Circuits and Systems Research Center

Director: **Bertan Bakkaloglu**

Connection One is a National Science Foundation Industry/University Cooperative Research Center that is focused on developing next-generation antennas, low-power computer chips, advanced transistor models and cutting-edge multiple-function circuitry to enhance technologies ranging from cellular and environmental to medical and defense applications.

Connection One currently has 43 PhD students, 20 masters students, 1 post doc and 3 undergraduates conducting research on a broad range of topics, including MEMS and nanotechnologies for RF and mixed-signal ICs, RF transmitter and receiver design, ultra-low power systems design, VLSI design, RADHARD electronics, RFIC remote sensing wireless devices, ultra-low power smart sensors, etc.

For a list of projects and areas of research, visit the Connection One website at [www.connectionone.org](http://www.connectionone.org)

### Highlights, 2008-2009:

- EE professors, **Bertan Bakkaloglu** and **Kevin Cao**, received an NSF award, titled "Neuromorphic Computing for VLSI Construction." The project's focus is investigating how the brain works on VLSI processors, especially in the areas of dynamic power scaling and branch prediction.
- EE professor and Connection One/WINTech faculty, **Junseok Chae**, received a NSF-CAREER award, titled "A Probe-less Large-array Protein Sensor Via MEMS Technology," which will tackle the fundamental limits of protein biosensors that use bioreceptors (e.g., antibody, DNA, enzyme) to capture target proteins such as cancer biomarkers. Using the proteins' adsorption/exchange phenomena and the inherent characteristics of proteins by nature, the project seeks to design a MEMS protein sensor array without using conventional bioreceptors. The goal is to develop a miniaturized portable protein sensor that is both cost effective and robust against environmental changes.



# RESEARCH CENTERS

## PSERC: The Power Systems Engineering Research Center

PSERC Director: **Vijay Vittal**

Site Director for ASU: **Gerald Heydt**

PSERC is a National Science Foundation Industry/University Cooperative Research Center (I/UCRC) comprising 13 universities and over 35 industry members, addressing challenges in the electric power industry raised by new market structures and ways of doing business. PSERC is headquartered at Arizona State University.

PSERC's diverse focus includes new emerging technologies in the electric power industry, customer demands for customized services, strategic choices between centralized and decentralized technologies, institutional changes creating mega-RTOs, new environmental priorities and the need for well-trained power engineers of the future, who are knowledgeable about the trends transforming the industry.

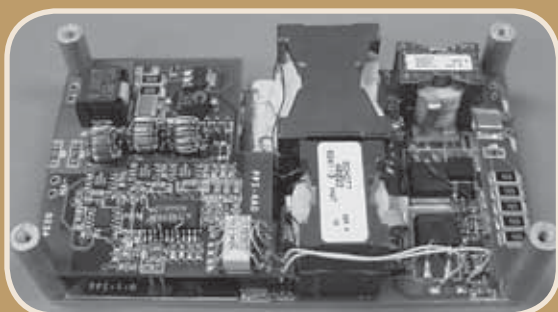
PSERC draws on university capabilities and industry know-how to creatively address these challenges. Its core purpose is to empower minds to engineer the future electric energy system.

The multidisciplinary expertise of PSERC's researchers includes power systems, applied mathematics, complex systems, computing, control theory, power electronics, operations research, non-linear systems, economics, industrial organization and public policy.

PSERC partners with private and public organizations that provide integrated energy services, transmission and distribution services, power system planning, control and oversight, market management services and public policy development. PSERC's comprehensive research program spans

- market research with a focus on market design, verification and validation in the context of electricity market restructuring,
- transmission and distribution for improved performance through new applications of innovative technologies and
- systems research to increase use, efficiency and reliability of increasingly complex and dynamic power systems.

**Additional information on PSERC is available at**  
<http://www.pserc.org>



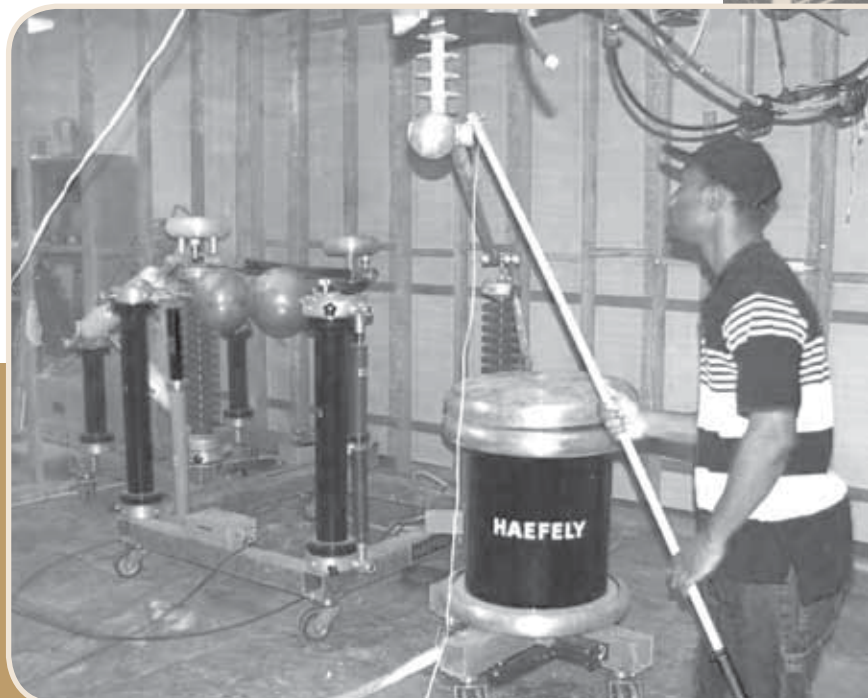
### Highlights, 2008-2009:

- The DoE-National Energy Technology Laboratory (NETL) awarded PSERC a 5-year \$15 million grant in support of the Consortium for electric reliability technology solutions. This involves a joint effort with Pacific Northwest National Labs, Lawrence Berkeley National Labs, and Sandia National Labs to develop tools and methods to improve the reliability of the nation's electric grid.
- PSERC developed two white papers on smart grid and increased penetration of renewable resources in the grid, outlining PSERC's position on research that needs to be pursued to facilitate a seamless transition of large-scale renewable resources while transforming the infrastructure into a smart grid.

### The white paper can be found at

[http://www.pserc.org/ecow/get/publicatio/2009public/pserc\\_smart\\_grid\\_white\\_paper\\_march\\_2009\\_adobe7.pdf](http://www.pserc.org/ecow/get/publicatio/2009public/pserc_smart_grid_white_paper_march_2009_adobe7.pdf)

[http://www.pserc.org/ecow/get/publicatio/2009public/pserc\\_energy\\_modeling\\_white\\_paper\\_march\\_2009\\_adobe7.pdf](http://www.pserc.org/ecow/get/publicatio/2009public/pserc_energy_modeling_white_paper_march_2009_adobe7.pdf)



## RESEARCH CENTERS

**SenSIP: Sensors, Signal and Information Processing Center****Co-Directors: Andreas Spanias and Antonia Papandreou-Suppappola**

The Sensors, Signal and Information Processing Center (SenSIP) is focused on state-of-the-art research in integrated sensing and processing and wireless sensor networks. The center integrates multidisciplinary research in signal processing, wireless communication networks, biosensing, information theory, applied mathematics, energy systems and mechanical engineering. Its collaborators include ASU's School of Arts, Media and Engineering (AME) and the Biodesign Institute. SenSIP received official status as an ABOR (Arizona Board of Regents) center in 2008.

Since its beginnings in 2004, SenSIP has worked on several collaborative projects, including NSF-funded projects on ion channel sensors with CSSER, an MRI project with faculty from ASU's School of Mathematics and Statistical Sciences and scientists from the Barrow's Neurological Institute in Phoenix, and an Earth Systems project with Johns Hopkins University. Additional SenSIP projects include two electro-chemical sensor projects (NIH and Defense Intelligence Agency) with ASU's Biodesign Institute and a NASA project with ASU's mechanical engineering faculty. SenSIP researchers are recipients of several federal grants from NSF, DARPA, AFOSR, and ONR. The center has also been awarded four Multi-University Research Initiative (MURI) sites from the Department of Defense since 2004. Two large education projects have also been funded by NSF in the DSP and multimedia networks areas.

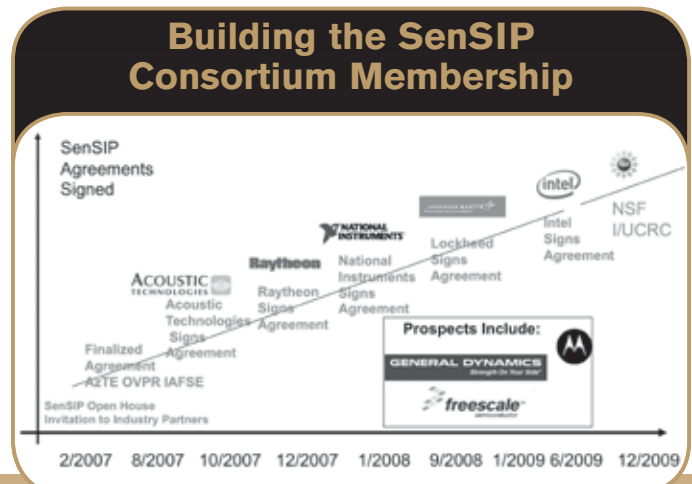
**Highlights, 2008-2009:**

- A prestigious AFOSR MURI site was recently established by Dr. **Junshan Zhang** in collaboration with Princeton University, California Institute of Technology, Stanford University, the University of California-Irvine, the University of Pennsylvania and the University of Wisconsin-Madison. The objective of this project is to develop the fundamental science necessary to design and manage wireless networks with high interference and intermittent connectivity.
- The SenSIP center and consortium signed a global engagement agreement to work with the KIOS Center of the University of Cyprus on Intelligent Networks. The agreement involves four universities including Politecnico di Milano, ETH Zurich, Arizona State University and the University of Cyprus. The project will be sponsored by the Cyprus Research Promotion Foundation.
- Dr. **Chaitali Chakrabarti** received a large 5-year NSF grant with the University of Michigan on reclaiming Moore's law through ultra energy efficient computing.

- Dr. **Antonia Papandreou-Suppappola** received an AFOSR award on integrated multi-modal RF sensing. This collaborative project is with AFRL, the University of Rhode Island, the University of California at Irvine and Penn State University.
- The SenSIP industry consortium, organized in 2007, consists of industry members, Acoustic Technologies, Intel Corporation, Lockheed Martin, National Instruments, and Raytheon Missile Systems. Sponsored consortium projects include nonlinear echo cancellation, radar signal processing, DSP software tools, DSP sensor management tools. Dr. **Andreas Spanias**, the consortium director, has recently obtained an NSF industry/university collaborative research center (IUCRC) planning grant whose goal is to establish this consortium as an NSF center.

**Areas of Concentration:**

- Waveform-Agile and Adaptive Sensing
- Information and Coding Theory and Applications
- Biomedical Processing and Biosensing
- Signal Processing for Communications
- Wireless Communications
- Digital Signal Processing
- Genomic Signal Processing
- Signal Processing for Energy Systems
- Speech, Audio, and Multimedia Signal Processing
- Image and Video Processing
- Perceptual Video Coding
- Multimedia Networks
- Information Networks
- Signal analysis for Nanosensors and MEMS
- DSP for Arts, Media and Engineering
- Java-DSP Development for Education and Research
- Signal Processing for Earth Systems
- Radar systems and defense applications
- Low-power Signal Processing
- Signal Processing and Embedded Systems Architectures



# RESEARCH CENTERS

## AIRE: Arizona Initiative for Renewable Energy

Director: **Stephen Goodnick**

The mission of the Arizona Initiative for Renewable Energy (AIRE) is to research and develop reliable, affordable and renewable energy sources and storage suitable for commercialization in the Southwest United States.

AIRE's initiatives encompass key energy research issues in bioenergy, photovoltaics, solar thermal, fuel cell/energy storage and energy system testing – bringing together a broad base of ASU talent and expertise from engineering, physics, chemistry, biosciences as well as the social sciences. The goal is to create prototypes and systems analysis for renewable energy sources and develop curricula and training that concentrate both on the technology of renewable energy, as well as its social, economic and policy advancement implications.

AIRE consolidates ASU's multifaceted expertise and provides strategic direction for pursuing new initiatives in applied research, industry participation and education and outreach. In the area of basic and applied research, for example, AIRE works to proactively identify federal initiatives in renewable energy and leverage these opportunities through a coordinated effort in information sharing across disciplines and industry stakeholders, while generating support for state-driven initiatives, such as the Science Foundation of Arizona.

AIRE serves as a catalyst for attracting new renewable energy industries to Arizona to grow the renewable energy market. It provides the framework to create industry alliances, consortia and collaborations with state entities and national labs and institutions. AIRE's education and outreach efforts have included a renewable energy track recently established in ASU's Barrett's Honor College; a new graduate interdisciplinary program, as well as undergraduate research experiences in renewable energy issues; and extended and online short courses and certificate programs.

The following core competencies at ASU provide the structure and impetus for AIRE's renewable energy efforts:

- ASU's Center for Bioenergy and Photosynthesis pursues transdisciplinary research in the use of biological and artificial systems based on biological principles. A recent \$14 million Department of Energy grant will fund a new center for bio-inspired solar fuel production.
- ASU has recently stood-up the Solar Power Laboratory, headed by Christiana Honsberg, who joined ASU in January 2009 from the University of Delaware. SPL has a focus on solar cell efficiency limits, ultra-high efficiency photonic energy conversion, new materials, nanostructures and designs for efficient photovoltaic and photothermal solar energy conversion, as well as new, low cost, scalable manufacturing approaches.
- The Center for Renewable Energy Electrochemistry (CREE) is a leader in renewable electrochemically-based energy storage and conversion research for improved electrochemical performance through alternative electrolytes, such as ionic liquids as well as new catalysts in non-acid based electrolytes. CREE was recently awarded a \$5 million Advanced Research Projects Agency—Energy (ARPA-e) grant on metal-air battery systems in partnership with Fluidic Energy, Inc.
- ASU's Tubes in the Desert project researches how photosynthetic organisms store energy and ways to develop similar processes that can be utilized in manmade systems.
- The Laboratory for Algae Research and Biotechnology at the ASU Polytechnic Campus researches algae samples as a renewable and sustainable source of oil for biodiesel and other bioproducts.
- ASU is one of the few schools to receive multiple Solar America Initiative awards from the U.S. Department of Energy.
- Cross-disciplinary efforts that address the energy grid infrastructure, supply chain, policy and transition include the participation of many ASU centers, academic programs and institutes, including the Decision Theater, Center for Solid State Sciences, the Flexible Display Center, the Power Systems Engineering Research Center, the Photovoltaics Lab, the College of Design, the Solar Power Laboratory, the Center for Renewable Energy Electrochemistry, the Center for Energy Policy and Outcome and the Arizona Technology Enterprise, to name a few.



Visit the AIRE website for more information:  
<http://aire.asu.edu/>

# RESEARCH CENTERS

## AINE: Arizona Institute of Nano-Electronics

Director: **Stephen Goodnick**

The Arizona Institute of Nano-Electronics (AINE) seeks to make a mark as a source of pioneering innovation in the nascent field. Headed by Dr. Stephen Goodnick, AINE serves as an umbrella organization that directs the efforts of four different research centers, while coordinating their work with other industry and multidisciplinary initiatives.

The main focus of AINE is partnering with both research-based institutions and relevant industry members in order to significantly impact the future technology areas related to ultra-low power and ultra-high speed electronics, as well as hybrid biomolecular electronics. AINE consists of four research centers:

### Center for Biomolecular Integrated Circuits

Director: **Trevor Thornton**

The CBIC aims to combine the realms of electronics and biological functions. It seeks to use micro-electro-mechanical systems (MEMS) fabrications and microelectronic technologies to enhance the working of existing circuit technologies and their biological and chemical capabilities.

[http://www.asu.edu/aine/cbic/cbic\\_main.html](http://www.asu.edu/aine/cbic/cbic_main.html)

### Center for Applied Nanoionics

Director: **Michael N. Kozicki**

The CANi lies at the cutting edge of worldwide research in materials and devices that rely on ion transport and chemical change at the nanoscale. Outreach into the educational, research and industrial communities is a significant part of CANi's work. The CANi intends to act as a liaison between academic research in the field as well as relevant industry players by holding an annual symposium in the field.

[http://www.asu.edu/aine/cani/cani\\_main.html](http://www.asu.edu/aine/cani/cani_main.html)

### Center for Computational Nanoscience

Director: **Marco Saraniti** and **Mark van Schilfgaarde**

The CCN's strength lies in novel devices and the prediction of device performance, which is especially crucial for nanoelectronics technologies. The center brings together faculty from different science disciplines whose interests involve the area of modeling and simulation. Many of CCN's researchers are known as developers of formalism and methodology in the area of electronic structure, which is relevant to the fundamental properties of devices.

[http://www.asu.edu/aine/ccn/ccn\\_main.html](http://www.asu.edu/aine/ccn/ccn_main.html)

### Center for Nanophotonics

Director: **Yong-Hang Zhang**

The CNP has four main areas of research: optical properties of compound semiconductor nanostructures and devices; silicon-based nanophotonic structures and devices; energy conversion materials and devices; and organic and biophotonics. The center combines work in a range of theoretical and applied research, from photon-matter interactions to optical sensors for medical and biological use.

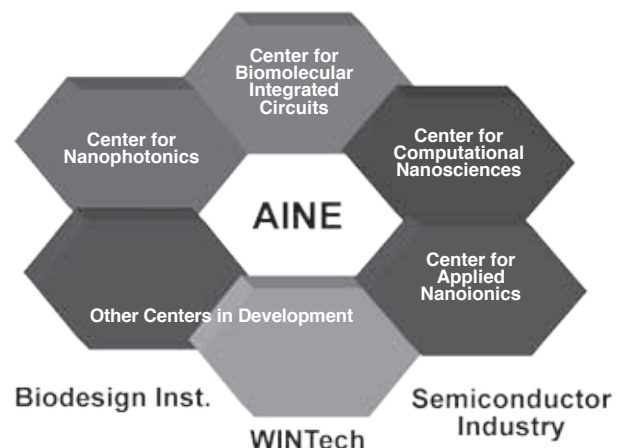
[http://www.asu.edu/aine/nanop/nanop\\_main](http://www.asu.edu/aine/nanop/nanop_main)

### Highlight, 2008-2009:

ASU joined the National Nanotechnology Infrastructure Network, which is an integrated partnership of 14 user facilities across the US, supported by NSF, providing extensive support in nanoscale fabrication, synthesis, characterization, modeling, design, computation and hands-on training.

**Additional information about AINE and its constituent research centers can be found at:**

<http://www.asu.edu/aine/>



*AINE Structure*



**Abbas Abbaspour-Tamijani**

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Dr. Abbas Abbaspour-Tamijani joined ASU in the fall of 2004. He received a PhD in electrical engineering from the University of Michigan, Ann Arbor, in 2003, and his BS and MS degrees from the University of Tehran, Iran, in 1994 and 1997, respectively. From 1997 to 2000, he worked as a consulting RF engineer. In 2004, he was a senior Antenna RF Engineer with Motia Inc., Pasadena, California.

Dr. Abbaspour-Tamijani is a member of the IEEE Microwave Theory and Techniques, Antennas and Propagation, and Engineering in Medicine and Biology societies. In 2008, he was a recipient of DARPA's Microsystems Technology Office Young Investigator Award.

**Research Interests:** Novel device concepts for reconfigurable radio systems, including beam-steerable and reconfigurable antennas and ultrawideband tunable filters, vibrating and non-vibrating RF MEMS technologies for communications and sensing, multi-functional millimeter-wave modules, and applications of microwave technology for neural interfacing and biotelemetry.

**Selected Publications:**

A. Abbaspour-Tamijani, C.C. Cheng, and B. Lakshminarayanan, "A Ka-band reconfigurable lens-array antenna with monolithically-integrated MEMS switches," IEEE Transactions on Microwave Theory and Techniques, to appear in August 2009.

A. Abbaspour-Tamijani, G.M. Rebeiz, and K. Sarabandi, "A Millimeter-Wave Bandpass Filter-Lens Array," IET Microwaves, Antennas Propagation, vol. 1, 388-395, April 2007.

A. Abbaspour-Tamijani and C.C. Cheng, "Study of Two-Bit Reconfigurable Antenna-Filter-Antenna Elements for Adaptive Millimeter-Wave Lens-Arrays," IEEE Transactions on Microwave Theory and Techniques, vol. 54, 4498-4506, December 2006.

A. Abbaspour-Tamijani, L.C. Kempel, G.M. Rebeiz, and Schoenlinner, "Switchable Low-Loss RF-MEMS Ka-Band Frequency-Selective Surface," IEEE Transactions on Microwave Theory and Techniques, vol. 52, 2474-2481, November 2004.

A. Abbaspour-Tamijani, G.M. Rebeiz and K. Sarabandi, "Antenna-Filter-Antenna Arrays as a Class of Bandpass Frequency Selective Surfaces," IEEE Transactions on Microwave Theory and Techniques, vol. 52, 1781-1789, August 2004.



**James T. Aberle**

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James T. Aberle received the BS and MS degrees in electrical engineering from the Polytechnic Institute of New York (now Polytechnic University) in 1982 and 1985, respectively, and the PhD degree in electrical engineering from the University of Massachusetts in 1989. From 1982 to 1985, he was employed by Hazeltine Corporation, Greenlawn, N.Y., where he worked on the development of wide-band phased array antennas. He was a graduate research assistant at the University of Massachusetts from 1985 to 1989, where he developed and validated computer models for printed antennas. He has been a faculty member at Arizona State University since 1989, and is currently an associate professor of electrical engineering. His research interests include the design of radio frequency systems for wireless applications as well as the modeling of complex electromagnetic phenomena.

In addition to his position as a faculty member at ASU, Dr. Aberle has been a NASA/ASEE summer faculty fellow at NASA Langley Research Center (1993), a visiting academic at the Royal Melbourne Institute of Technology in Melbourne, Victoria, Australia (1997), a visiting researcher at Atlantic Aerospace Electronics Corp. in Greenbelt, M (1998), and a senior member of the technical staff at a start-up company (2000-2002).

**Research Interests:** Antennas and RF systems for wireless communications, modeling of complex electromagnetic phenomena.

**Selected Publications:**

J.T. Aberle, "Two-Port Representation of an Antenna With Application to Non-Foster Matching Networks," IEEE Transactions on Antennas and Propagation, vol. 56, no. 5, 1218-1222, May 2008.

J.T. Aberle, S.-H. Oh, and G.A. Taylor, "Frequency-Agile Antennas for a Software-Defined and Cognitive Radio", Ed. R. Waterhouse, Printed Antennas for Wireless Communications, John Wiley and Sons, 379-406, 2007.

S-H., Oh, H. Song, J. T. Aberle, B. Bakaloglu, and C. Chakrabarti, "Automatic antenna-tuning unit for software-defined and cognitive radio," Wireless Communication & Mobile Computing, vol. 7, issue 9, 1103-1115, 2007.

**Personal Web site:**  
<http://www.fulton.asu.edu/~aberle>



**David R. Allee**

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David R. Allee received his BS in electrical engineering from the University of Cincinnati in 1984 and MS and PhD in electrical engineering from Stanford University in 1986 and 1990, respectively. He was a post-doctoral fellow at Cambridge University in 1990 and 1991. While at Stanford University, and as a Research Associate at Cambridge University, he fabricated scaled field effect transistors with ultra-short gate lengths using custom e-beam lithography. He also invented several ultra-high resolution lithography techniques including direct e-beam irradiation of SiO<sub>2</sub>, and nanometer scale patterning of various organic and inorganic films with scanning tunneling lithography (ASU). Since joining Arizona State University, his primary focus has been on mixed signal integrated circuit design. As a founding member of the NSF Center for Low Power Electronics and the Whitaker Center for Neuromechanical Control, he has designed several custom analog to digital converters and telemetry ICs. David is currently Director of Research for Backplane Electronics for the Flexible Display Center at Arizona State University, and he is investigating a variety of flexible electronics applications. He has been a regular consultant with several semiconductor industries on low voltage, low power mixed signal circuit design. He has co-authored over 75 archival scientific publications.

**Selected Publications**

D.R. Allee, A. Avendano-Bolivar, B. Gnade, S. Gowrisanker, R.Krishna, K. Kaftanoglu, M. Quevedo-Lopez, and S. Venugopal, "Flexible CMOS and Electrophoretic Displays," Society for Information Displays, International Symposium, Digest of Technical Papers, San Antonio, Texas, May 31- June 5, 2009. (Invited Paper)

D.R. Allee, C. Balanis, K. Baugh, E. Forsythe, B. Gnade, T. Jackson, H. McHugh, D. Morton, M. Quevedo, and S. Venugopal, "Flexible Integrated Sensor Systems," Special Operations Forces Industry Conference, Tampa, Florida, June 2-4, 2009.

D.R. Allee, E.J. Bawolek, L.T. Clark, J.J. Ravindra Fernando, K. Kaftanoglu, Z.P. Li, S. O'Rourke, R. Shringarpure, H. Shivalingaiah, S.G. Uppili, S.M. Venugopal, and B.D. Vogt, "Degradation Effects in a-Si:H Thin Film Transistors and Their Impact on Circuit Performance," IEEE Transactions on Electron Devices, vol. 56, no. 6, 1166-1176, June 2009.



### Raja Ayyanar

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 Associate Professor, PhD, University of Minnesota

Rajapandian Ayyanar joined the ASU faculty as an assistant professor in August 2000. He received a BE in electrical engineering from P.S.G. College of Technology, India in 1989; an MS in power electronics from the Indian Institute of Science in 1995; and a PhD in power electronics from the University of Minnesota in 2000. He has published over 50 journal and conference papers in the area of switch mode power electronics and holds two U.S. patents. Dr. Ayyanar was awarded the ONR Young Investigator Award in 2005.

**Research Interests:** Power electronics, DC-DC converters, voltage regulators and power management, power conversion and control for renewable energy interface especially PV and wind, smart grid technologies, plug-in electric vehicles, digital PWM techniques for motor drives

#### Selected Publications:

- R. Ayyanar and B.S. Oraw, "Voltage Regulator Optimization Using Multiwinding Coupled Inductors and Extended Duty Ratio Mechanisms," IEEE Transactions on Power Electronics, vol. 24, 1494-1505, June 2009.
- R. Ayyanar, H.K. Krishnamurthy and X. Mao, "Optimal Variable Switching Frequency Scheme for Reducing Switching Loss in Single-Phase Inverters Based on Time-Domain Ripple Analysis," IEEE Transactions on Power Electronics, vol. 24, 991-1001, April 2009.
- R. Ayyanar and X. Mao, "Average and Phasor Models of Single Phase PV Generators for Analysis and Simulation of Large Power Distribution Systems," Proc. IEEE Applied Power Electronics Conference (APEC), 1964-1970, Feb 15-19, 2009.
- G. Narayanan, D. Zhao, H.K. Krishnamurthy, R. Ayyanar and V.T. Ranganathan, "Space vector based hybrid PWM techniques for reduced current ripple," IEEE Transactions on Industrial Electronics, vol. 55, 1614-1627, April 2008.
- V. Choudhary, E. Ledezma, R. Ayyanar and R.M. Button, "Fault tolerant circuit topology and control method for input-series and output-parallel modular DC-DC converters," IEEE Transactions on Power Electronics, vol. 23, 402-411, January 2008.
- R. Ayyanar, and N. Mohan, "Zero Voltage Switching DC-DC Converter," U.S. patents 6,611,444 and 6,310,785.



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 Associate Professor, PhD, Oregon State University

Bertan Bakkaloglu joined the ASU faculty in August 2004. He received a PhD in electrical and computer engineering in 1995 from Oregon State University. Prior to ASU, Dr. Bakkaloglu was with Texas Instruments where he was responsible for analog, mixed signal and RF system-on-chip development for wireless and wireline communication transceivers. He is a steering committee member for IEEE Radio Frequency Integrated Circuits Conference and founding chair of the IEEE Solid State Circuits Society Phoenix Chapter. He is an associate editor of IEEE Transactions on Circuits and Systems.

**Research Interests:** RF and mixed-signal IC design, wireless and wireline communication circuits and systems, integrated power management for digital communication transceivers, biomedical and chemical instrumentation ICs

#### Selected Publications:

- B. Bakkaloglu, W. Y. Chu, and S. Kiaei, "A 10 MHz Bandwidth, 2 mV Ripple PA Regulator for CDMA Transmitters," IEEE Journal of Solid-State Circuits, vol. 43, no. 12, 2809-2819, December 2009.
- B. Bakkaloglu, K. Hoon, W. Oh, and C. Wang, "A CMOS Low Noise, Chopper Stabilized Low-Dropout Regulator with Current-Mode Feedback Error Amplifier," IEEE Transactions on Circuits and Systems I, vol. 55, no. 10, 3006-3015, November 2008.
- B. Bakkaloglu, and X. Wang, "Systematic Design of Supply Regulated LC-Tank Voltage-Controlled Oscillators," IEEE Transactions on Circuits and Systems I, vol. 55, no. 7, 1834-1844, August 2008.
- B. Bakkaloglu, T. Copani, S. Kiaei, and S. M. Taleie, "A Linear  $\Sigma\Delta$  Digital IF to RF DAC Transmitter With Embedded Mixer," IEEE Transactions on Microwave Theory and Techniques, vol. 56, no. 5, 1059-1068, May 2008.
- B. Bakkaloglu, H. Barnaby, K. Chandrashekar, H. H. Chung, T. Copani, I. Deligoz, S. Goswami, A. Jain, H. Karaki, S. Kiaei, J. Kitchen, and B. Vermeire, "A Fully Integrated Pulsed-LASER Time-Of-Flight Measurement System with 12ps Single-Shot Precision," IEEE Custom Integrated Circuits Conference, 359-362, September 21-24, 2008.



### Constantine A. Balanis

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Constantine A. Balanis joined the ASU faculty in 1983 and is now a Regents' Professor of electrical engineering. He has published over 130 journal papers, 225 conference papers, 12 book chapters, 8 magazine/newsletter papers, and numerous scientific reports. He has also published two textbooks: *Antenna Theory: Analysis and Design* and *Advanced Engineering Electromagnetics* and one book *Introduction to Smart Antennas*.

**Research Interests:** Computational electromagnetic methods (FDTD, FEM, MoM, GO/GTD/UTD, PO/PTD) for antennas, scattering, and high-intensity radiated fields (HIRF), smart/adaptive antennas for wireless communications, and electromagnetic wave multipath propagation.

Honors and Distinctions: Regents' Professor, Honorary Doctorate-University of Thessaloniki (Greece), IEEE Life Fellow, IEEE Third Millennium Medal, IEEE AP Society Chen-To Tai Distinguished Educator Award, ASU Outstanding Graduate Mentor Award, ASU School of Engineering Graduate Teaching Excellence Award, ASU College of Engineering Distinguished Achievement Award, IEEE Region 6 Individual Achievement Award, IEEE Phoenix Section Special Professionalism Award.

#### Selected Publications:

- C. A. Balanis, C. R. Birtcher, C. Polycarpou, and V. Kononov, "Non-Uniform Field Modeling of Ferrite-Loaded Cavity-Backed Slot Antennas," IEEE Trans. Antennas Propagat., vol. 57, 2009.
- P. Bevelacqua and C. A. Balanis, "Geometry and Weight Optimization for Minimizing Sidelobes in Wideband Planar Arrays," IEEE Trans. Antennas Propagat., Vol. 57, No. 4, pp. 1285-1289, April 2009.
- C. A. Balanis, D. DeCarlo, and J. Lambert, "Spherical Cap Adaptive Antennas for GPS," IEEE Trans. Antennas Propagat., vol. 57, no. 2, 406-413, February 2009.
- C. A. Balanis, Ed., *Modern Antenna Handbook*, John Wiley & Sons, Inc., 1680, 2008.
- C. A. Balanis, C. R. Birtcher, and B. Yang, "The Effects of Passengers on Mutual Coupling in a Simplified Fuselage: Simulations and Measurements," IEEE Trans. Electromagnetic Compatibility, vol. 50, no. 3, part II, 751-754, August 2008.

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**Hugh Barnaby**

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 Associate Professor, PhD, Vanderbilt University

Hugh Barnaby joined the ASU faculty in 2004. Prior to coming to ASU, he was an assistant professor at the University of Arizona. His primary research focuses on the analysis, modeling and experimental characterization of extreme environment effects in semiconductor materials, devices and integrated circuits. As part of this research, he also develops design and processing techniques that enable the reliable operation of electronics in these environments. In addition, Dr. Barnaby has ongoing research activities in wireless (RF and optical) IC and data converter design, radiation-enabled compact modeling, energy harvesting, and bio-electronics. He has been an active researcher in the microelectronics field for 15 years in both industry and academics, presenting and publishing more than 100 papers during this time.

**Research Interests:** Semiconductors for hostile environments, device physics and modeling, microelectronic device and sensor design and manufacturing, analog/RF/mixed signal circuit design and test.

**Honors and Distinctions:** ONR Faculty Research Fellow, Senior Member IEEE; Session chairperson, 2008 IEEE IRPS, 2005 RADECS conference, 2002 IEEE NSREC; Short Course Chairman, IEEE NSREC 2007; Poster Chairman, IEEE NSREC 2006; Short Course Instructor, NSREC 2005; Awards Committee, IEEE NSREC 2003, 2008, Solid State Circuits Society Phoenix Section Chairman

**Selected Publications:**

H. J. Barnaby, W. Chen, T. Copani, S. Goswami, S. Kiaei, J. Silver, and B. Vermeire, "A 14mW 5Gbps CMOS Trans-impedance Amplifier with Gain-Reuse Regulated Cascode Compensation for Parallel Optical Interconnects," IEEE International Solid-State Circuits Conference, Digest of Technical Papers, 100-101, February 8-12, 2009.  
 H.J. Barnaby and X.J. Chen, "The Effects of Radiation Induced Interface Traps on Base Current in Gated Bipolar Test Structures," Solid State Electronics, vol. 52, 683-687, May 2008.  
 H. J. Barnaby, X.J. Chen, I.S. Esqueda, and M.L. Mclain, "Modeling Ionizing Radiation Effects in Solid State Materials and CMOS Devices," IEEE Custom Integrated Circuits Conference (CICC), 273-280, September 2008.



**Jennifer M. Blain Christen**

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Jennifer Blain Christen joined the ASU faculty in 2008. She received a PhD in 2006 and an MS in electrical engineering in 2001 from the Johns Hopkins University. She conducted her post-doctoral research at the Immunogenetics Department of the Johns Hopkins Medical School. Her research focuses on engineering systems that directly interface biology; this interface usually includes low-power analog circuits and microfluidics.

**Research Interests:** Bio-compatible integration techniques for CMOS electronics, microfluidics and soft lithography, 3D and non-traditional microfabrication techniques and devices, MEMS devices with emphasis on bio-MEMS, analog and mixed-mode VLSI for bio-medical/analytical instrumentation including SOS/SOI technologies.

**Honors and Distinctions:** STIMESI Design Contest (International MEMS Competition) Winner (2008) National Science Foundation Graduate Teaching Fellow in K-12 Education (2005-2006), National Science Foundation Graduate Research Fellowship (2001-2005), General Electric Faculty for the Future Undergraduate Engineering Research Opportunities Grant (1998), Maryland Scholars Award (1997).

**Selected Publications:**

J. M. Blain Christen and R. Winsor, "An Optical Waveguide in a Silicon Wafer," accepted in Journal of Lightwave Technology.  
 J.M. Blain Christen, B. Iglehart and P.O. Pouliquen, "Ultra-High Dilution Microfluidic System for Single Strand DNA Isolation," IEEE International Symposium on Circuits and Systems, May 2008.  
 A.G. Andreou and J.M. Blain Christen, "Self-Biased Operational Transconductance Amplifier in 0.18 micron 3D SOI-CMOS," IEEE International Symposium on Circuits and Systems, May 2007.  
 A.G. Andreou, J.M. Blain Christen and B. Iglehart, "Localized Closed-Loop Temperature Control and Regulation in Hybrid Silicon/Silicon Life Science Microsystems," IEEE International Symposium on Circuits and Systems, May 2007 – Student Paper Contest Honorable Mention.



**Yu (Kevin) Cao**

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Kevin Cao joined the ASU faculty in 2004. He received a PhD in electrical engineering in 2002 and an MA in biophysics in 1999 from the University of California, Berkeley, and conducted his post-doctoral research at the Berkeley Wireless Research Center. He has published more than 120 articles and co-authored one book on nano-CMOS physical and circuit design. He has served on the technical program committee of many conferences and is a member of the IEEE EDS Compact Modeling Technical Committee.

**Research Interests:** Physical modeling of nanoscale technologies, design solutions for variability and reliability, and reliable integration of post-silicon technologies.

**Honors and Distinctions:** Promotion and Tenure Faculty Exemplar, Arizona State University, 2009; Distinguished Lecturer of the IEEE Circuits and Systems Society, 2009; Chunhui Award for Outstanding Oversea Chinese Scholars, China, 2008; Best Paper Award at the International Low-Power Electronics and Design, 2007; IBM Faculty Award, 2007 and 2006; NSF Faculty Early Career Development (CAREER) Award, 2006; Best Paper Award at the International Symposium on Quality Electronic Design, 2004; Beatrice Winner Award, International Solid-State Circuits Conference, 2000; Biophysics Graduate Program Fellowship at the University of California, Berkeley, 1997-98; UC Regents Fellowship at University of California, Santa Cruz, 1996-97.

**Selected Publications:**

D. Acharyya, K. Agarwal, Y. Cao, F. Liu, S. R. Nassif, K. Nowka and W. Zhao, "Rigorous extraction of process variations for 65nm CMOS design," IEEE Transactions on Semiconductor Manufacturing, vol. 22, no. 1, 196-203, February 2009.  
 T. Austin, V. Bertacco, Y. Cao and S. Mahlke, "Reliable systems on unreliable fabrics," IEEE Design & Test of Computers, vol. 25, no. 4, 322-332, July-August, 2008.  
 B. H. Calhoun, Y. Cao, X. Li, K. Mai, L. T. Pileggi, R. A. Rutenbar, and K. L. Shepard, "Digital circuit design challenges and opportunities in the era of nanoscale CMOS," Proceedings of the IEEE, vol. 96, no. 2, 343-365, February 2008.



### Junseok Chae

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Junseok Chae joined the ASU faculty in 2005. He received his MS and PhD in electrical engineering in 2000 and 2003 from the University of Michigan, Ann Arbor, respectively. From 2003 to 2005, he was a postdoctoral research fellow at WIMS (Wireless Integrated MicroSystems) – ERC (Engineering Research Center), University of Michigan.

His areas of interests are MEMS sensors, integration of nanostructures on MEMS, MEMS packaging, and Bio-MEMS. He has published over 60 conference/journal articles and book chapters. He holds a couple of U.S. patents and is a recipient of the NSF CAREER Award on a MEMS protein sensor array.

**Research Interests:** Micro-electro-mechanical-systems sensors/actuators, micro-EMS packaging, hybrid integration: From nano to micro, micro to macro-worlds, bio-MEMS.

**Honors and Distinctions:** NSF CAREER award, 2009; Best Poster Award in IEEE International Conference on Sensors, 2007. First place prize and the Best Paper, DAC (Design Automation Conference) Student Design Contest, 2001.

#### Selected Publications:

- J. Chae, and Y. Yang, "Separation of beta-human Chorionic Gonadotropin and Immunoglobulin G by a Miniaturized Size Exclusion Chromatography Column," *Applied Physics Letters*, vol. 94, 173902, 2009.
- J. Chae, J. Harrison, S. Je, J. Kim, and M. Kozicki, "In-Situ Tuning of Omni-Directional Micro-Electro-Mechanical-Systems Microphones to Improve Performance Fit in Hearing Aids," *Applied Physics Letters*, vol. 93, 123501, 2008.
- S. Choi, Y. Yang, and J. Chae, "Surface Plasmon Resonance Protein sensor Using Vroman Effect," *Biosensors and Bioelectronics*, vol. 24, no. 4, 899-905, 2008.
- J. Chae, J. Giachino, and K. Najafi, "Fabrication and Characterization of a Wafer-Level MEMS Vacuum Package with Vertical Feedthroughs," *IEEE Journal of Microelectromechanical Systems*, vol. 17, 193-200, 2008.

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### Chaitali Chakrabarti

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 Professor, PhD, University of Maryland

Chaitali Chakrabarti received her B. Tech. in electronics and electrical communication engineering from the Indian Institute of Technology, Kharagpur, India, and her MS and PhD degrees in electrical engineering from the University of Maryland, College Park. She is an associate editor of the *IEEE Transactions on VLSI Systems* and the *Journal of VLSI Signal Processing Systems*.

**Research Interests:** VLSI architectures and algorithms for media processing and wireless communications, low-power embedded system design including those powered by fuel cell-battery sources, low power algorithm design and algorithm-architecture co-design of signal processing systems.

**Honors and Distinctions:** Outstanding Educator Award, IEEE Phoenix section, 2001; CEAS Teaching Award, 1993-1994.

#### Selected Publications:

- C. Chakrabarti, L. Deng, K. Irick, M. Kandemir, J. S. Kim, P. Mangalagiri, V. Narayanan, N. Pitsianis, K. Sobti and X. Sun, "An Automated Framework for Accelerating Numerical Algorithms on Reconfigurable Platforms using Algorithmic/Architectural Optimizations," *IEEE Transactions on Computers*, Fall 2009.
- C. Chakrabarti and Y. Zhu "Architecture-Aware LDPC Code Design for Multi-Processor Software Defined Radio Systems," *IEEE Transactions on Computers*, Fall 2009.
- C. Chakrabarti, N. Chang, K. Lee, S. Vrudhula and J. Zhuo, "A Fuel-Cell Battery Hybrid for Portable Embedded Systems," *ACM Transactions on Design Automation of Embedded Systems*, January 2008.
- R. Bruce, C. Chakrabarti, K. Flautner, D. Kershaw, Y. Lin, S. Mahlke, T. Mudge, A. Reid, Y. Lin and M. Woh, "From SODA to Scotch: The Evolution of a Wireless Baseband Processor," *Proc. of IEEE/ACM Symposium on Microarchitecture (MICRO)*, November 2008 - Best Paper Award.
- B. Bakkaloglu, C. Chakrabarti and Y. Li, "A Comprehensive Energy Model and Energy-Quality Evaluation for Wireless Transceiver Front-ends," *IEEE Transactions on VLSI Systems*, 90-103, January 2007.

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### Lawrence T. Clark

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Lawrence T. Clark worked at Intel Corporation after receiving his BS in computer science in 1983. Later, Dr. Clark worked at VLSI Technology Inc. designing PC chipsets. He received his PhD in 1992 after receiving his MS in 1987, both in electrical engineering from Arizona State University. He re-joined Intel in 1992. While at Intel, Dr. Clark also was an adjunct professor at ASU. For the 2003-2004 school year, he was an associate professor at the University of New Mexico. He joined ASU in August 2004.

Prof. Clark has been awarded 62 patents, and has about 15 pending. He has published over 70 peer reviewed technical papers. He has approximately 15 years of industry experience in various aspects of chipset, CMOS imager, and microprocessor design, test engineering and TCAD. He contributed to the Pentium, Itanium and XScale microprocessor designs. Most recently, he was a principal engineer at Intel where he managed circuit design for XScale microprocessors.

**Research Interests:** Circuits and architectures for low power and high performance VLSI, radiation hardened circuit design and CAD for VLSI.

**Honors, Distinctions, and Professional Service:** Senior member of IEEE; associate editor of *IEEE Transactions on Circuits and Systems II*; guest editor of *J. Solid-state Circuits*; recipient of the Intel Achievement Award and multiple Intel Divisional Recognition Awards.

#### Recent Publications:

- L. Clark and G. Sampson, "Low Power Critical Timing Race Free Programmable Logic Arrays," *IEEE J. Solid-state Circuits*, vol. 44, 3, 935-946, March 2009.
- D. Allee, E. Bawolek, L. Clark, J. Fernando, Z. Li, K. Kaftanoglu, S. O'Rourke, H. Shivalingaiah, R. Shringarpure, S. Uppili, S. Venugopal and B. Vogt, "Degradation Effects in a-Si:H Thin Film Transistors and Their Impact on Circuit Performance," *IEEE Trans. Elec. Dev.*, vol. 56, no. 6, 1166 - 1176, June 2009.
- L. Clark, N. Desai and J. Haigh, "Reducing Process Variation Impact on Replica-timed Static Random Access Memories," in press for *Integration: The VLSI Journal*, 2009.



**Douglas Cochran**

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 Assistant Dean for Research, Associate Professor, PhD, Harvard University

Douglas Cochran joined the ASU faculty in 1989 and now serves as assistant dean for research in the Ira A. Fulton School of Engineering. He holds PhD and SM degrees in applied mathematics from Harvard University and degrees in mathematics from UCSD and MIT. Before coming to ASU, he was a senior scientist at BBN Laboratories. Professor Cochran has served as program manager for mathematics in the U.S. Defense Advanced Research Projects Agency, as a consultant for the Australian Defense Science and Technology Organisation, as associate editor of the IEEE International Conference on Acoustics, Speech, and Signal Processing and in the 1997 U.S.-Australia Workshop on Defense Signal Processing.

**Research Interests:** Sensor signal processing, applied harmonic analysis, detection theory.

**Honors and distinctions:** Top 5% of Fulton School of Engineering Teaching Faculty Commendation, 2007; U.S. Secretary of Defense Medal for Exceptional Public Service, 2005; Engineering Teaching Excellence Award, 1996-1997; IEEE Senior Member.

**Selected Recent Publications:**

D. Chakraborty, N. Kovvali, J. Wei, A. Papandreou-Suppappola, D. Cochran, and A. Chattopadhyay, "Damage Classification for Structural Health Monitoring using Time-Frequency Techniques," *Journal of Intelligent Material Systems and Structures*, in press.  
 Hero, A. O., Castanon, D. A., Cochran, D., & Kastella, K. (Eds.). (2007). *Foundations and applications of sensor management*. New York: Springer Publishing.  
 S.P. Sira, D. Cochran, A. Papandreou-Suppappola, D. Morrell, W. Moran, S.D. Howard, and R. Calderbank, "Adaptive Waveform Design for Improved Detection of low RCS Targets in Heavy Sea Clutter," *IEEE Journal on Selected Areas in Signal Processing*, vol. 1(1), 55-66, June 2007.  
 V. Berisha, N. Shah, D. Waagen, H. Schmitt, S. Bellofiore, A. Spanias, and D. Cochran "Sparse Manifold Learning with Applications to SAR Image Classification," *Proceedings of the 2007 IEEE International Conference on Acoustics, Speech, and Signal Processing*, vol. 3, 1089-1092, April 2007.



**Rodolfo Diaz**

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During his 20 years in the aerospace industry, Dr. Diaz has worked on many aspects of the interaction between electromagnetic waves and materials, from lightning protection on the space shuttle through the design of microwave lenses and high-temperature broadband radomes for radar missiles to the design and manufacture of radar-absorbing structures for Stealth applications. He joined the ASU Faculty in 1998 and currently is an associate professor of electrical engineering. Dr. Diaz is the former associate director of the Consortium for Metrology of Semiconductor Nanodefects, interim director of the Consortium for Engineered materials in the School of Materials at ASU. He also holds 20 patents ranging from the design of broadband radomes to the amplification of magnetic fields.

**Research Interests:** Optical scattering of subwavelength objects in complex environments and nanophotonics, analytic theory of natural and artificial media, measurement of electromagnetic properties of materials, combined computational mechanics and electromagnetics.

**Honors and Distinctions:** 1994 Association of Interamerican Businessmen Award to Distinguished Young Executives in the Professional Category for Excellence in Engineering, San Juan, Puerto Rico.

**Selected Publications:**

A. H. Panaretos, and Diaz, R.E. "A simple and accurate methodology to optimize parameter-dependent finite-difference time-domain schemes," *IEEE Transactions on Microwave Theory and Techniques*, vol. 56, no. 5, 1125-1136, May 2008.  
 A. H. Panaretos, J. T. Aberle, and R. E. Diaz, "The effect of the 2-D Laplacian operator approximation on the performance of finite-difference time-domain schemes for Maxwell's equations," *Journal of Computational Physics*, vol. 227, issue 1, 513-536, November 2007.  
 A. H. Panaretos, J. T. Aberle, and R. E. Diaz, "A Three-Dimensional FDTD Scheme Based on a Transversely Extended Curl Operator," *IEEE Transactions on Microwave Theory and Techniques* 54(12), 4237-4246, December 2006.



**Tolga M. Duman**

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 Professor, PhD, Northeastern University

Tolga M. Duman received a BS from Bilkent University, Turkey in 1993 and his MS and PhD degrees from Northeastern University in 1995 and 1998, respectively, all in electrical engineering. He has been with ASU's Department of Electrical Engineering since August 1998.

**Research Interests:** Digital communications, wireless and mobile communications, channel coding, turbo codes and turbo-coded modulation systems, sensor and ad-hoc networks, coding for magnetic recording channels, underwater acoustic communications, and coding for wireless communications.

**Honors and Distinctions:** NSF CAREER Award, 2000; IEEE Third Millennium Medal, Editor for *IEEE Trans. on Wireless Communications* (2003-2008), and *IEEE Trans. on Communications* (2007-present).

**Selected Publications:**

T. Gucluoglu and T. M. Duman, "Performance Analysis of Transmit and Receive Antenna Selection over Flat Fading Channels," *IEEE Transactions on Wireless Communications*, vol. 7, no. 8, 3056-3065, August 2008.  
 J. Hu and T. M. Duman, "Graph-Based Detection Algorithms for Layered Space-Time Architectures," *IEEE Journal of Selected Areas in Communications (JSAC)*, vol. 26, no. 2, 269-280, February 2008.  
 T.M. Duman and A. Ghayeb, *Coding for MIMO communication systems*, West Sussex, England: Wiley, 2007.  
 Z. Zhang and T. M. Duman, "Capacity Approaching Turbo Coding for Half Duplex Relaying," *IEEE Transactions on Communications*, vol. 55, no. 10, 1895-1906, October 2007.  
 S. Roy, T. M. Duman, V. McDonald, and J. G. Proakis, "High Rate Communication for Underwater Acoustic Channels Using Multiple Transmitters and Space-Time Coding: Receiver Structures and Experimental Results," *IEEE Journal of Oceanic Engineering*, vol. 32, no. 3, 663-688, July 2007.

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## Richard Farmer

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Richard Farmer has over 50 years of electric power industry experience. He has been a teaching associate and adjunct professor at Arizona State University since 1966. He has co-authored a book on the application of series capacitors in power systems and has written over 40 industry papers.

**Research Interests:** Extra-high voltage (EHV) project planning and interaction of turbine generators with EHV transmission systems.

**Honors and Distinctions:** IEEE Fellow, NSPE Arizona Engineer of the Year, IEEE Power System Engineering Distinguished Service Award, IEEE Third Millennium Medal, IEEE Power System Dynamic Performance Committee Distinguished Service Award, IEEE Phoenix Section Senior Engineer of the Year Award, 2004, National Academy of Engineering Member, Colorado State University Distinguished Alumnus Award, IEEE Charles Concordia Power System Engineering Award, IEEE Power Engineering Society Fellows Committee Chair, National Academy of Engineering Peer Review Committee.

### Selected Publications:

S.R. Puchalapalli, R.G. Farmer, G.G. Karady, J. Hernandez, and Y. Suh, "Z-Bus based Frequency Scanning Program for Sub-Synchronous Resonance Screening," Proceedings of 2007 IEEE Lausanne, Power Tech Conference, Lausanne Switzerland.  
 R.G. Farmer, B.L. Agrawal, and D.G. Ramey "Power System Dynamic Interaction with Turbine-Generators," Electric Power Engineering Handbook, Boca Raton, FL: CRC Press, 2007.  
 R.G. Farmer, and E.H. Allen, "Power System Dynamic Performance Advancement from History of North American Blackouts," Proceedings of the 2006 IEEE PES Power Systems Conference and Exposition, Oct. 29 – Nov. 1, 2006, Atlanta, GA.  
 Priyantha Sirisooriya, G.G. Karady, and R.G. Farmer, "A Flow-based Approach for Evaluating Fuel Cell Interconnections to a Distribution Feeder," Proceedings of 2005 IEEE St. Petersburg Power Tech Conference.  
 E. Kyriakides and R.G. Farmer, "Modeling of Damping for Power System Stability Analysis," Electric Power Components and Systems Journal, vol. 32, no. 8, 827-837, August 2004.



## David K. Ferry

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 Regents' Professor, PhD, University of Texas

David Ferry joined ASU in 1983 following stints at Texas Tech University, the Office of Naval Research and Colorado State University. He has published more than 750 articles, books and chapters and has organized many conferences.

**Research Interests:** Transport physics and modeling of quantum effects in submicron semiconductor devices, scanning gate microscopy of quantum properties of mesoscopic devices.

**Honors and Distinctions:** Regents' Professor at ASU, IEEE Cleo Brunetti Award, 1999, fellow of the American Physical Society, Fellow of IEEE, Fellow of Institute of Physics, ASU Graduate Mentor Award, 2000, IEEE Engineer of the Year, 1990, Phoenix Section, outstanding research awards at Texas Tech University and Colorado State University.

### Selected Publications:

A.W. Cummings, R. Akis, and D. K. Ferry, "Subband Anticrossing and the Spin Hall Effect in Quantum Wires," Journal of Physics Condensed Matter, 21, 055502, 1-7, 2009.  
 R. Akis, B.R. Bennett, A.M. Burke, T. Day, D.K. Ferry and G. Speyer, "Imaging Scarred States in Quantum Dots," Journal of Physics Condensed Matter, 21, 212201, 5, 2009.  
 D. K. Ferry and R. Shishir, "Intrinsic Mobility in Graphene," Journal of Physics Condensed Matter, 21, 232204, 2009.  
 R. Akis, R. Brunner, D. K. Ferry, F. Kuchar, and R. Meisels, "Coupling-Induced Bipartite Pointer States in Arrays of Electron Billiards: Quantum Darwinism in Action?," Phys. Rev. Lett., 101, 024102, 1-4, 2008.  
 R. Akis, D.K. Ferry and M. Gilbert, "Some Considerations on Nanowires in Nanoelectronics," IEEE Transactions on Electron Devices, 58, 2820-2826, 2008.

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## David H. Frakes

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David Frakes joined ASU in the spring of 2008. He received MS degrees in Electrical Engineering and Mechanical Engineering from the Georgia Institute of Technology, where he also earned a PhD in Bioengineering and performed post-doctoral work.

**Research Interests:** Vascular flow imaging and fluid dynamics, suppression of optical turbulence distortion in video, machine vision for industrial control systems.

**Honors and Distinctions:** Arizona State University Centennial Professor of the Year Award (2009), Georgia Institute of Technology Council of Outstanding Young Alumni (2007), Georgia Research Alliance Phase I and II Grant Awards (2004, 2005).

### Selected Publications:

D. Frakes, K. Kanter, R. Krishnankutty, K. Pekkan, J. Rossignac, S. Sharma, K. Sundareswaran, K. Pekkan, B. Whited and A. Yoganathan, "Patient-Specific Surgical Planning and Hemodynamic Computational Fluid Dynamic Optimization through Free-Form Haptic Anatomy Editing Tool (SURGEM)," Medical and Biological Engineering and Computing, vol. 46:11, 139-52, November 2008.  
 J. Carberry, L.P. Dasi, D. Frakes, H.D. Kitajima, H.L. Leo, K. Pekkan, H. Simon, K. Sundareswaran, A.P. Yoganathan and D. de Zelicourt, "Modified Control Grid Interpolation for the Volumetric Reconstruction of Fluid Flows," Experiments in Fluids, vol. 45:6, 987-97, December 2008.  
 L.P. Dasi, D. Frakes, H.D. Kitajima, K. Pekkan, M.J.T. Smith and A.P. Yoganathan, "A New Adaptive Method for Registration-Based Medical Image Interpolation," IEEE Transactions on Medical Imaging vol. 27:3, 370-377, March 2008.  
 D. Frakes, J. Huey, A. Khalid, J. Lawrence and W. Singhose, "Human Operator Performance Testing Using an Input-Shaped Bridge Crane," Journal of Dynamic Systems, Measurement, and Control, vol. 128:1, 1-8, December 2006.



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Gennady Gildenblat received the MSEE (with honors) from the St. Petersburg Electrical Engineering Institute in 1975 and the PhD degree in solid-state physics from the Rensselaer Polytechnic Institute in 1984. He works in the areas of semiconductor device physics and modeling, novel semiconductor devices and semiconductor transport. Dr. Gildenblat has over 140 publications in these areas including several books, invited articles and US patents.

In 1980, he joined the General Electric Corporate Research and Development Center in Schenectady, NY, where he was engaged in various aspects of semiconductor device physics and IC technology development. Between 1984 and 1986, he supervised the Cryogenic CMOS device engineering study at the Digital Equipment Corporation in Hudson, MA. From 1986, Dr. Gildenblat was with The Pennsylvania State University, until in 2006 he joined Arizona State University. He has developed an advanced surface-potential-based SP and PSP compact MOSFET models. The PSP model (joint development with Philips) has been selected as a new international industry standard by the Compact Model Council (PSPmodel.asu.edu) in 2006. PSP-based compact varactor model (joint development with Jazz semiconductor) became another industry standard in 2007.

**Research Interests:** Physics and modeling of semiconductor devices, semiconductor transport physics, integrated circuit technology.

**Selected Publications:**

G. Gildenblat, D.B.M. Klaassen, R. van Langevelde, X. Li, C.C. McAndrew, A.J. Scholten, G.D.J. Smit, S. Veeraraghavan, G.O. Workman and W. Wu, "A Compact Model for Valence-Band Electron Tunneling Current in Partially Depleted SOI MOSFETs," IEEE Transaction on Electron Devices, vol. 54, no. 2, 316-322, February 2007.  
 G. Gildenblat, W. Wu and Z. Zhu, "Analytical Expression for the Bias and Frequency-Dependant Capacitance of MOS Varactors," IEEE Transactions on Electron Devices, vol. 54, 3107-3108, 2007.



**Stephen Goodnick**

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Stephen Goodnick is presently Director of the Arizona Institute for Renewable Energy and Director of the Arizona Institute for Nanoelectronics. He recently served as Associate Vice President for Research from 2006-2008. He came to ASU in Fall 1996 as department chair. Prior to that, he was a professor of electrical and computer engineering at Oregon State University from 1986 to 1996. He has also been a visiting scientist at the Solar Energy Research Institute and Sandia National Laboratories and a visiting faculty member at the Walter Schottky Institute, Munich, Germany; the University of Modena, Italy; the University of Notre Dame, and Osaka University, Japan. He served as President (2003-2004) of the Electrical and Computer Engineering Department Heads Association (ECEDHA), and as program chair of the Fourth IEEE Conference on Nanotechnology. Dr. Goodnick has published over 185 refereed journal articles, books and book chapters.

**Research Interests:** Transport in semiconductor devices, computational electronics, quantum and nanostructured devices and device technology, high-frequency and optical devices.

**Honors and Distinctions:** Fellow, IEEE, 2004; Alexander von Humboldt Research Fellow, Germany, 1986; College of Engineering Research Award, Oregon State University, 1996; Colorado State University College of Engineering Achievement in Academia Award, 1998; IEEE Phoenix Section Society Award for Outstanding Service, 2002.

**Selected Publications:**

S. M. Goodnick, I. Knezevic, E. B. Ramayya and D. Vasileska, "Electron Mobility in Silicon Nanowires," IEEE Transactions on Nanotechnology, vol. 6:1, 113-117, 2007.  
 R.S. Eisenberg, S.M. Goodnick, M. Goryll, J.M. Tang, T.J. Thornton, L. Petrossian and S.J. Wilk, "Integrated Electrodes on a Silicon Based Ion Channel Measurement Platform," Biosensors & Bioelectronics, vol. 23:2, 183-190, 2007.  
 L. Petrossian, S. J. Wilk, P. Joshi, S. Hihath, J. D. Posner, S. M. Goodnick, and T. J. Thornton, "High aspect ratio cylindrical nanopores in silicon-on-insulator substrates," Solid State Electronics, vol. 51:10, 1391-1397, 2007.



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Dr. Ravi Gorur joined the faculty at ASU in 1987 as an assistant professor after graduating with a PhD from the University of Windsor, Canada in 1986. Since 1995, he has held the position of professor, and presently he is the Program Chair in the School of Electrical, Computer and Energy Engineering.

Dr. Gorur is a fellow of the IEEE and the U.S. representative to CIGRE study committee D1 "Materials for Advanced Technologies." He has authored a textbook on outdoor insulators and more than 150 papers in IEEE journals and conferences on the subject of outdoor insulators for electric power transmission and distribution. He works in other related areas such as liquid dielectrics, dielectrics for aircraft and communications systems. He teaches a short course on the subject of insulators that is offered to the industry annually.

**Research Interests:** Dielectrics and electrical insulating materials for outdoor power delivery, nanodielectrics, electric field calculations, HV testing techniques and computer aided design.

**Honors and Distinctions:** IEEE Fellow, 1999; U.S. representative to CIGRE Study Committee D1 (materials for advanced technologies).

**Selected Publications:**

A. Rawat and R.S. Gorur, "Microstructure Based Evaluation of Field Aged and New Porcelain Suspension Insulators," IEEE Transactions on Dielectrics and Electrical Insulation, vol. 16, no. 1, 107-115, 2009.  
 D. Rodriguez-Sanabria, R. S. Gorur and P. Hansen, "Role of Humidity on the Breakdown Characteristics of Air in Uniform Field Gaps at Very Low Frequency (VLF)," IEEE Transactions on Dielectrics and Electrical Insulation, no. 2172, 2009.  
 R. S. Gorur, "A Balanced Approach to Insulator Selection and Specification," INMR World Congress on Insulators, Arresters and Bushings, CRETE, 10-20, 2009.  
 K. Sheno and R.S. Gorur, "Evaluating Station Post Insulator Performance from Electric Field Calculations," IEEE Transactions on Dielectrics and Electrical Insulation, vol. 15, no. 6, 1731 - 1738, 2008.  
 S. Venkataraman, R.S. Gorur and A.P. Mishra, "Impact of Weathering on Flashover Performance of Nonceramic Insulators," IEEE Transactions on Dielectrics and Electrical Insulation, vol. 15, no. 4, 1073-1080, 2008.



### Michael Goryll

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 Assistant Professor, PhD, RWTH Aachen University, Germany

Michael Goryll joined the faculty in 2007. He received a PhD in Physics in 2000 and a Diplom in Physics in 1997, both from the RWTH Aachen University, Germany. He performed his post-doctoral research on biosensors at ASU during the years 2003-2005. Before joining ASU, Dr. Goryll spent several years at the Research Centre Juelich, the largest national research lab in Germany, focusing on SiGe Chemical Vapor Deposition and biosensor development.

**Research Interests:** Surface and interface physics, new materials in CMOS processing, fabrication of nanoscale semiconductor devices, biosensors based on silicon, biological signal transduction phenomena, electrophysiological properties of cell membrane ion channels, low-noise analog amplifier circuit design, electronic instrumentation for biophysical measurements.

**Honors and Distinctions:** Helmholtz Research Fellowship for outstanding young investigators granted by the Research Centre Jülich, Germany (2001-2005), Post-Graduate Scholarship granted by the RWTH Aachen University, Germany (1997-2000)

#### Selected Publications:

M. Goryll and N. Chaplot, "Miniaturized Ion Channel Reconstitution Platform Based on Silicon Microfabrication," *Biophysical Journal* 96(3), 51a, 2009.

F. Lanzerath, D. Buca, H. Trinkaus, M. Goryll, S. Mantl, J. Knoch, U. Breuer, W. Skorupa, and B. Ghyselen, "Boron Activation and Diffusion in Silicon and Strained Silicon-On-Insulator by Rapid Thermal and Flash Lamp Annealings," *Journal of Applied Physics* 104(4), 044908-1-7, 2008.

S. J. Wilk, L. Petrossian, M. Goryll, T. J. Thornton, S. M. Goodnick, J. M. Tang, and R. S. Eisenberg, "Integrated electrodes on a silicon based ion channel measurement platform," *Biosensors & Bioelectronics* 23(2), 183-190, 2007.

K. M. Indlekofer, M. Goryll, J. Wensorra, and M. I. Lepsa, "Quantum point contact due to Fermi-level pinning and doping profiles in semiconductor nanocolumns," *Applied Physics A* 87(3), 559-562, 2007.



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 Regents' Professor, PhD, Purdue University

Gerald Thomas Heydt is from Las Vegas, NV. He holds a BEEE degree from the Cooper Union in New York and MSEE and PhD. degrees from Purdue University. He spent approximately 25 years as a faculty member at Purdue, and in 1994, he took the position of site director of the NSF and industrially supported Power Systems Research Center at ASU. He has industrial experience with the Commonwealth Edison Company in Chicago, E.G. & G. in Mercury, NV, and with the United Nations Development Program. In 1990, he served as the program manager of the National Science Foundation program in power systems engineering. He is the author of two books in the area of power engineering. Dr. Heydt is a Regents' Professor at ASU; he is a member of the National Academy of Engineering, and a Fellow of the IEEE.

**Research Interests:** Power engineering, electric power quality, distribution engineering, transmission engineering, computer applications in power engineering, power engineering education, power system sensors and instrumentation.

**Honors and Distinctions:** Fellow of the IEEE, member of the United States National Academy of Engineering, Edison Electric Institute Power Engineering Educator Award, 1989, IEEE Power Engineering Society Power Engineering Educator of the Year, 1995.

#### Selected Publications:

J.W. Stahlhut, T. J. Browne, G. T. Heydt, and V. Vittal, "Latency Viewed as a Stochastic Process and its Impact on Wide Area Power System Control Signals," *IEEE Transactions on Power Systems*, vol. 23, no. 1, 84 – 91, February 2008.

E. Kyriakides, M. M. Albu, G. T. Heydt, "Identification of the Standard Parameters of a Steam Turbine – Generator Using Wavelet Denoising," *Journal of Electric Power Components and Systems*, vol. 38, no. 10, 1145 – 1158, October 2007.

R. Pérez, G. Heydt, G. Karady, and J. Ramírez, "Electrical and Environmental Considerations of an Arizona - Mexico HVDC Tie," *Journal of Electric Power Components and Systems*, vol. 35, no. 9, 1027 – 1040, September 2007.

**Personal Web site:**  
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### Keith Holbert

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 Associate Professor, PhD, University of Tennessee

Keith Holbert joined the faculty in 1989. He is a registered professional engineer and has published over 85 journal and conference papers.

**Research Interests:** Process monitoring and diagnostics, sensor fault detection, instrumentation development, fuzzy logic, spacecraft charging, and radiation effects on electronics.

**Honors and Distinctions:** Tau Beta Pi; Teaching Excellence Award from ASU College of Engineering, 1997; IEEE Senior Member; Outstanding Faculty Award, IEEE Phoenix Section, 2007.

#### Selected Publications:

K.E. Holbert and K. Lin, "Applying the Equivalent Pi Circuit to the Modeling of Hydraulic Pressurized Lines," *Mathematics and Computers in Simulation*, vol. 79, no. 7, 2064-2075, March 2009.

G.G. Karady and K.E. Holbert, "Strategies, Challenges and Prospects for Active Learning in the Computer-Based Classroom," *IEEE Transactions on Education*, vol. 52, no. 1, 31-38, February 2009.

K.E. Holbert and K. Lin, "Blockage Diagnostics for Nuclear Power Plant Pressure Transmitter Sensing Lines," *Nuclear Engineering and Design*, vol. 239, no. 2, 365-372, February 2009.

D.M. Geschke, A.S. Heger, K.E. Holbert and R. M. Stewart, "Prediction of Coming InfiniCor 300 Optical Fiber Attenuation at Low Gamma Dose Rates," *IEEE Transactions on Nuclear Science*, vol. 55, no. 6, 3515-3522, December 2008.

D. R. Alexander, L. T. Clark, N. Hindman, K. E. Holbert, W. M. Shedd, and X. Yao, "The Impact of Total Ionizing Dose on Unhardened SRAM Cell Margins," *IEEE Transactions on Nuclear Science*, vol. 55, no. 6, 3280-3287, December 2008.

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### Christiana Honsberg

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Professor, Christiana Honsberg joined the electrical engineering faculty in 2008 and is currently a professor. She received her B.S., M.S. and Ph.D. from University of Delaware in 1986, 1989, and 1992, respectively, all in electrical engineering. Before joining the ASU faculty, Honsberg was an associate professor and director for the high performance solar power program at the University of Delaware. She currently holds one patent in the US, Japan and Europe; three patents are pending.

**Research Interests:** Ultra-high efficiency solar cells, and Silicon solar cells

#### Selected Publications:

S.P. Bremner, M.Y. Levy, and C.B. Honsberg, "Limiting Efficiency of an Intermediate Band Solar Cell Under a Terrestrial Spectrum," *submitter Applied Physics Lett.*, February 2008.

S.P. Bremner, G.M. Liu, N. Faleev, K. Gosh, and C.B. Honsberg, "Growth and characterization of GaAs<sub>1-x</sub>Sb<sub>x</sub> barrier layers for advanced concept solar cells," *Journal of Vacuum Science and Technology B*, 2008.

C.B. Honsberg, and M.Y. Levy, "Nanostructured Absorbers for Multiple Transition Solar Cells," *IEEE Transaction on Electron Devices*, vol. 56, no. 3, 706-711, 2008.

S.P. Bremner, M.Y. Levy, and C.B. Honsberg, "Analysis of Tandem Solar cell Efficiencies under AM 1.5G Spectrum Using a Rapid Flux Calculation Method," *Progress in Photovoltaics: Research and Application*, available online, February 2008.

O. Jani, I. Ferguson, C.B. Honsberg, and S. Kurtz, "Design and Characterization of GaN/InGa<sub>N</sub> Solar Cells," *Applied Physics Lett.*, vol. 91, no. 13, 1-3, 2007.

N. Fleeve, C.B. Honsberg, O. Jani, and I. Ferguson, "Crystalline Perfection of GaN and Al<sub>1</sub>N Epitaxial Layer and the Main Features of Structural Transformation of Crystalline Defects," *Journal of Crystal Growth*, vol. 300, 1400-1405, 2006.

O.K. Jani and C.B. Honsberg, "Absorption and Transport via Tunneling in a Quantum Well Solar Cells," *Solar Energy*, July 28, 2006.

B.S. Richards, S.F. Rowlands, A. Ueranasun, J.E. Cotter, and C.B. Honsberg, "Potential Cost Reduction of Buried-Contact Solar Cells through the Use of Titanium Dioxide Thin Films," *Solar State Electronics*, vol. 50, 1400-1405, 2006.



### Joseph Hui

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 Office: GWC 411  
 ISS Chair Professor, PhD, Massachusetts Institute of Technology

Joseph Y. Hui joined ASU as ISS Chair Professor in 1999. He received his BS, MS and PhD degrees from MIT. He held research and teaching positions at Bellcore, Rutgers University and the Chinese University of Hong Kong before joining ASU. He is the founder of IXTech and IXSoft, Inc.

**Research Interests:** Wireless networks, gigabit wireless communications, ATM switching and routing, teletraffic analysis, coding and information theory, space-time communications.

**Honors and Distinctions:** ISS Chair Professor, IEEE Fellow, 1996; HKIE Fellow, 1998; NSF Presidential Young Investigator, 1990; IEEE William Bennett Prize Paper Award, 1984; Henry Rutgers Research Fellow, 1989.

#### Selected Publications:

J. Hui, and D. Daniel, "Terabit Ethernet: A Time-Space Carrier Sense Multiple Access Method," *Proceedings of the 2008 IEEE Globecom*, 1-6, 2008.

J. Hui, and L. Li, "First-fit Scheduling for Multi-stage Packet Switching Networks," *Proceedings of 2008 High Performance Switching and Routing Symposium*, 197-202, also accepted for publication as a journal paper, 2008.

J. Hui, and D. Daniel, "Virtualization of Local Computer Bus Architectures over the Internet," *IEEE Globecom 2007 Internet Protocol Symposium*, November 2007.

J. Hui, and P.C. Gurumohan, "Selfish Vs. Social Routing with Competitive Traffic Pricing," in *proceeding of 43rd Annual Allerton Conference on Communication, Control, and Computing*, 341-345, September 2005.

J. Hui, S.B. Narasimhamurthy, P.C. Gurumohan, and S. Sreenivasamurthy, "Quanta Data Storage: An Information processing and Transportation Architecture for Storage Area Networks," *IEEE Journal on Selected Areas in Communications*, vol. 23, issue 10, 2032-2040, October 2005.

J. Hui and Y. Wu, "Scalable Ad-Hoc Network Routing Based on the Distance-Matrix Shortest Path Routing," *Proceedings of 2004 IEEE International Conference on Networking, Sensing, and Control*, 5 pages, Taipei, Taiwan, March 21-23, 2004.



### Bahar Jalali-Farahani

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 Assistant Professor, PhD, Ohio State University

Bahar Jalali-Farahani joined ASU in spring 2006 as an assistant professor. She received her PhD in electrical engineering from The Ohio State University in 2005, and BS and MS degrees in electrical engineering from the University of Tehran, Tehran, Iran in 1996 and 1999, respectively.

**Research Interests:** Analog integrated circuits especially low power high performance designs, reliability issues in deep submicron technology, calibration techniques for analog to digital converters, circuit design for extreme environments, and analog design for wireless communication systems.

#### Selected Publications:

B. Jalali Farahani, and A. Meruva, "A 14-b 32MS/s Pipelined ADC with Fast Convergence Comprehensive Background Calibration," *Journal of Analog Integrated Circuits and Signal Processing*, Springer Publisher, 2009.

A. Meruva and B. Jalali-Farahani, "A 14-b 32MS/s Pipelined ADC with Fast Convergence Comprehensive Background calibration," submitted to *International Symposium on Circuits and Systems*, September 2009.

J. Wang and B. Jalali-Farahani, "A CT MASH  $\Sigma\Delta$  Modulator with Adaptive Digital Tuning for Analog Circuit Imperfections," *Midwest Symposium on Circuits and Systems*, 646-649, August 2008.

S. Thirunakkarasu A.I. Hossain and B.J. Farahani, "Sigma Delta Modulators with Modified Hybrid Integrators," *Midwest Symposium on Circuits and Systems*, 642-645, August 2008.

F. Ge and B. Jalali-Farahani, "A Versatile Chopper-Stabilized Rail-to-Rail Operational Amplifier," *Midwest Symposium on Circuits and Systems*, 113-116, August 2008.

B. Jalali Farahani and A. Meruva, "Low Power High Performance Digitally Assisted Pipelined ADC," *IEEE Annual Symposium on VLSI, ISVLSI08*, 111-116, April 2008.

B. Jalali-Farahani and M. Ismail, "Adaptive Noise Cancellation Techniques in Sigma-Delta Analog-to-Digital Converters," *IEEE Transactions on Circuits and Systems I*, vol. 54, issue 9, 1891-1899, September 2007.



### George G. Karady

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 Professor, PhD, University of Technical Sciences, Budapest

George G. Karady received his MS and PhD degrees in electrical engineering from the Technical University of Budapest. He was appointed as Salt River Chair Professor at ASU in 1986. Previously, he was with EBASCO Services where he served as chief consulting electrical engineer, manager of electrical systems and chief engineer of computer technology. He was electrical task supervisor for the Tokamak Fusion Test reactor project in Princeton. He graduated 19 PhD and 40 MS students.

Dr. Karady is an IEEE Fellow. He has published a book and has more than 120 journals and 180 conference publications.

**Research Interests:** Power electronics, high-voltage engineering and power systems.

**Honors and Distinctions:** Fellow of IEEE, Chair of IEEE PES IO Power Electronics Subcommittee. He chaired the Award Committee of the IEEE PES Chapters and Membership Division from 2000-2005 and was the President of the IEEE Phoenix Section in 2004. In 1996, Dr. Karady received an Honorary Doctoral Degree from the Technical University of Budapest, in 1999 the IEEE Third Millennium Medal, and in 2002 the IEEE Power Engineering Society Working Group Recognition Award as the Chair of WG that prepared IEEE Standard 1313-2.

#### Selected Publications:

K.E. Holbert and G.G. Karady, "Strategies, Challenges and Prospects for Active Learning in the Computer Based Classroom," IEEE Transaction on Education, vol.52, no. 1, 31-38, February 2009.

M. Argin and G. G. Karady, "Characterization of Polyurethane Dielectric Strength," IEEE Transactions on Dielectrics and Electrical Insulation, vol.15, 50-356, 2008.

G. G. Karady, E. Al-Amman and S. Venkataraman, "Performance Evaluation of Insulating Links Used for Worker Protection in Cranes," IEEE Transactions on Dielectrics and Electrical Insulation, vol. 15, 453-460, 2008.

#### Personal Web site:

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### Lina Karam

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Lina J. Karam received her BA in engineering from the American University of Beirut in 1989, and the MS and PhD degrees in electrical engineering from the Georgia Institute of Technology in 1992 and 1995, respectively. She is currently an associate professor and is also the director of the Image, Video, and Usability, the Multi-Dimensional DSP and the Real-Time Embedded Signal Processing Labs at ASU. Karam is the recipient of a National Science Foundation CAREER Award. She is the technical program chair of the 2009 IEEE International Conference on Image Processing, an associate editor of the IEEE Transactions on Image Processing, and the lead guest editor for the special issue on "Visual Quality Assessment" of the IEEE Journal on Selected Topics in Signal Processing. She serves on the technical committees of main IEEE conferences, including ICASSP, ICIP, ISCAS, and Asilomar.

**Research Interests:** Image and video processing, compression, and transmission, visual quality assessment, human visual perception, multidimensional signal processing, digital filtering, error-resilient source coding, and bio-medical imaging.

**Honors and Distinctions:** 2009 IEEE International Conference on Image Processing; IEEE Signal Processing and Communications Chapter, IEEE Phoenix Section, 2005; NSF CAREER Award, 1998; Georgia Tech Graduate Student Senate Presidential Citation Award, 1994; Society of Women Engineers Outstanding Graduate Student Award, 1994

#### Selected Publications:

W.-J. Chien and L.J. Karam, "BLAST-DVC: BitPlane Selective Distributed Video Coding," Springer Multimedia Tools and Applications, Special Issue on Distributed Video Coding, June 2009.

L.J. Karam, T. Ebrahimi, S. Hemami, T. Pappas, R. Safranek, Z. Wang, and A.B. Watson, "Introduction to the Special Issue on Visual Media Quality Assessment," IEEE Journal on Special Topics in Signal Processing, Special Issue on Visual Media Quality Assessment, vol. 3, no. 2, 189-192, April 2009.

#### Personal Web site:

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 Connection One Research Center; Professor, PhD, Washington State University

Dr. Kiaei is a professor in the Ira A. Fulton School of Engineering and the director of the National Science Foundation I/UCRC Connection One. He joined the Department of Electrical Engineering at Arizona State University in January 2001. Prior to joining ASU, he was with Motorola, Inc. Dr. Kiaei is involved with research and teaching classes in wireless transceiver design, communication circuits and analog circuits. His research team includes more than 12 research associates and graduate students at ASU. Dr. Kiaei is also an IEEE Fellow.

**Research Interests:** Wireless transceiver design, RF and mixed-signal ICs.

**Honors and Distinctions:** Carter Best Teacher Award, IEEE Darlington Best Paper Award, IEEE Fellow, and the Motorola 10X Design Award.

#### Selected Publications:

W. Khalil, B. Bakkaloglu, and S. Kiaei, "A Self-Calibrated On-Chip Phase-Noise Measurement Circuit with -75 dBc Single-Tone Sensitivity at 100 kHz Offset," IEEE Journal of Solid-State Circuits, vol. 42, issue 12, 2758 – 2765, December 2007.

S. Abedinpour, B. Bakkaloglu, and S. Kiaei, "A Multistage Interleaved Synchronous Buck Converter With Integrated Output Filter in 0.18  $\mu\text{m}$  SiGe Process," IEEE Transactions on Power Electronics, vol. 22, issue 6, 2164 – 2175, November 2007.

A. Carlosena, W.-Y. Chu, B. Bakkaloglu, and S. Kiaei, "Randomized Carrier PWM With Exponential Frequency Mapping," IEEE Transactions on Power Electronics, vol. 22, issue 3, 960 – 966, May 2007.

U. J. Lyles, T. Copani, B. Bakkaloglu, and S. Kiaei, "An Injection-Locked Frequency-Tracking  $\Sigma\Delta$  Direct Digital Frequency Synthesizer," Circuits and Systems II: Express Briefs, IEEE Transactions [see also IEEE Transactions on Analog and Digital Signal Processing, Circuits and Systems II] vol. 54, issue 5, 402 – 406, May 2007.

X. Chen and S. Kiaei, "Pulse Generation Scheme for Low-power Low-complexity Impulse Ultra-Wideband," Electronics Letters, vol. 43, issue 1, 44 – 45, January 2007.





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Michael Kozicki joined ASU in 1985 from Hughes Microelectronics. Kozicki is a professor of Electrical Engineering and the director of the Center for Applied Nanoionics. Furthermore, he has served as interim and founding director of Entrepreneurial Programs and director of The Center for Solid State Electronics Research in the Ira A. Fulton School of Engineering at ASU. He develops new materials, processes and device structures for next generation integrated circuits and systems. Kozicki holds several dozen key patents in Programmable Metallization Cell technology, in which solid electrolytes are used for the storage and control of information and for the manipulation of mass on the nanoscale. He has published extensively, developed undergraduate and graduate courses in solid state electronics and is a frequent invited speaker at international meetings. He is also a founder of Axon Technologies, an ASU spin-off company involved in the development and licensing of solid-state ionic technologies, Visiting Professor at the University of Edinburgh in the United Kingdom, and Adjunct Professor at GIST in Korea.

**Research Interests:** Integrated/solid-state nanoionics, low-energy non-volatile memory, self-healing electrodes and interconnect, and nano-electromechanical systems (NEMS).

**Honors and Distinctions:** Founder, Axon Technologies Corporation; Visiting Professor, College of Science and Engineering, University of Edinburgh; Adjunct Professor, GIST, Korea; Founding Member, Globalscot Network; Chartered Engineer (UK/EC Professional Engineer); Charter member of the ASU Academic Council; ASU Faculty Achievement Award (Most Significant Invention), 2007; Best Paper Awards, Non-Volatile Memory Technology Symposium, 2005, and European Symposium on Phase Change and Ovonic Science, 2006; IEEE Phoenix Section Outstanding Educator, Research Award, 2001

**Selected Publications:**

U. Russo, D. Kamalanathan, D. Ielmini, A.L. Lacaíta, and M.N. Kozicki, "Study of Multilevel Programming in Programmable Metallization Cell (PMC) Memory," IEEE Transactions on Electron Devices, vol. 56, issue 5, 1040 – 1047, 2009.

**Personal Web site:**

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Ying-Cheng Lai joined the ASU faculty in 1999. Prior to that, he was an associate professor of physics and mathematics at the University of Kansas. He has authored or co-authored 280 papers, including about 250 published in refereed journals. In the past five years, he gave about 50 invited seminars and colloquia worldwide.

**Research Interests:** Nonlinear dynamics, solid-state electronics, complex networks, signal processing, and computational biology.

**Honors and Distinctions:** Outstanding Referee Award, American Physical Society, 2008; Fellow of the American Physical Society since 1999; AFOSR/White House Presidential Early Career Award for Scientists and Engineers, 1997; NSF Faculty Early Career Award, 1997; Undergraduate Teaching Award in Physics, University of Kansas, 1998; Institute for Plasma Research Fellowship, University of Maryland, 1992; Ralph D. Myers Award for Outstanding Academic Achievement, University of Maryland College Park, 1988.

**Selected Publications:**

L. Huang, Y.-C. Lai and R. Yang, "Transient disorder in dynamically growing networks," Physical Review E, vol. 79, 046101, 1-7, 2009.

Y.-C. Lai, Y. Wang, and Z.-G. Zheng, "Onset of colored-noise induced synchronization in chaotic systems," Physical Review E, vol. 79, 056210, 1-8, 2009.

Y.-C. Lai, K. Park, and L. Rajagopalan, "Stochastic resonance and energy optimization in spatially extended dynamical systems," European Journal of Physics B, vol. 69, 65-70, 2009.

D.R. Akis, K. Ferry, S.M. Goodnick, L. Huang, and Y.C. Lai, "Transmission and scarring in graphene quantum dots," Journal of Physics: Condensed Matter (in press).

Q.F. Chen, L. Huang, and Y.-C. Lai, "Chaos-induced intrinsic localized modes in coupled micro-cantilever arrays," Applied Physics Letters, vol. 92, 241914, 1-3, 2008.

Y. Do and Y.-C. Lai, "Multi-stability and arithmetically period-adding bifurcations in piecewise smooth dynamical systems," Chaos, vol. 18, 043107, 1-9, 2008.

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 Stanford University

Deirdre Meldrum joined the ASU faculty in 2007 as Dean of Engineering, Director of the Center for Ecogenomics in the Biodesign Institute, and Professor of Electrical Engineering. Prior to ASU, she was Professor of Electrical Engineering at the University of Washington, where she founded and directed the UW's Genomation Laboratory. Dr. Meldrum is PI, Director of the National Institutes of Health, Center of Excellence in Genomic Sciences, Microscale Life Sciences Center funded for \$36 Million in August 2001 – July 2011. She is Editor for the IEEE Transactions on Automation Science & Engineering, General Chair for the IEEE Conference on Automation Science & Engineering 2007, and General Chair of the IEEE BioRobotics Conference 2008.

**Research Interests:** Automation in life sciences, automation, micro- and nano technologies, microscale systems, lab-on-a-chip, single cell, genomics, ecogenomics, robotics, control systems.

**Honors and Distinctions:** Distinguished Lecturer IEEE Robotics & Automation Society 2006-2009; Dive in the Alvin submersible off R/V Atlantis to 2200m below sea level at Endeavor Ridge in NE Pacific Ocean August 2007; Elected Fellow of the Institute of Electrical and Electronics Engineers, 2004; Elected Fellow of the American Association for the Advancement of Science, 2003; Presidential Early Career Award for Scientists and Engineers 1996-2001; NIH Special Emphasis Research Career Award 1993-1998

**Selected Publications:**

S. Bhushan, M. Holl, D. Meldrum, T. Ray and H. Zhu, "Characterization of deep wet-etching of fused silica glass for single cell and optical sensor deposition," Journal of Micromachining and Mechanics, accepted for publication 2009.

J.B. Anderson, L.W. Burgess, J.M. Dragavon, M.R. Holl, M.E. Lidstrom, S.C. McQuaide, D.R. Meldrum, T.W. Molter and A.C. Young, "A novel approach for measuring single cell oxygen consumption rates," IEEE Transactions on Automation Science and Engineering, vol. 5, no. 1, 32-42, January 2008.

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Cun-Zheng Ning joined ASU in 2006 as professor of electrical engineering from the NASA Center of Nanotechnology at NASA Ames Research Center, and University Affiliated Research Center (UARC) of University of California at Santa Cruz, where he was a senior scientist, group leader in nanophotonics and task manager in nanotechnology. He was an ISSP Visiting Professor at University of Tokyo (June-September, 2006) and a research assistant professor at University of Arizona. Ning has published over 130 papers and given over 80 invited/plenary/colloquium talks. He was Associate Editor of IEEE J. Quantum Electronics (2001-2003) and Guest Editor of several special issues of IEEE and OSA journals

**Research Interests:** Nanophotonics, nanowires, surface plasmons and nanolasers; nanomaterials-based detectors and solar cells; physics of nanostructures and many-body effects; modeling and simulation of optoelectronic devices; quantum optics, and two-photon lasers; geometric phases; stochastic resonances.

**Honors and Distinctions:** CSC Technical Excellence Award 2003, CSC Civil Group Presidential Award for Technical Excellence 2001, MRJ Award for Technical Achievement 2000, NASA Group Achievement Award 1999, IEEE/LEOS Distinguished Lecturer Award 2007-2009.

#### Selected Publications:

- A. Pan, W. Zhou, E. Leong, R. Liu, A.H. Chin, B.S. Zou, and C.Z. Ning, "Continuous Alloy-Composition Spatial Grading and Superbroad Wavelength-Tunable Nanowire Lasers on a Single Chip," *Nano Lett.*, vol.9, 784, 2009.
- A. Chin, S. Vaddiraju, A. Maslov, C. Z. Ning, M. Sunkara, and M. Meyyappan, "Near Infrared Sub-Wavelength-Wire Lasing," *Applied Physics Letters*, vol. 88, 163115, 2006.
- D. Sirbulu, M. Law, P. Pauzauskie, H. Yan, A. Maslov, K. Knutzen, C.Z. Ning, R. Saykally, and P. Yang, "Optical Routing with Nanoribbons and Nanowire Assemblies," *Proc. Nat. Acad. Sci. (USA)*, 7800, 102, 2005.
- C.Z. Ning, "Two-Photon Lasers Based on Intersubband Transitions in Semiconductor Nanostructures," *Physical Review Letters*, vol. 93, 187403, 2004.

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### Sule Ozev

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Sule Ozev received her B.S. degree in Electrical Engineering from Bogazici University, Turkey, and her M.S. and Ph.D. degrees in Computer Science and Engineering from University of California, San Diego in 1995, 1998, and 2002 respectively. Ozev joined the electrical engineering faculty in August of 2008 and is currently an associate professor. She serves on various program committees, including IEEE VLSI Test Symposium (2008-2010), IEEE/ACM Design Automation Conference (2007-2009), IEEE Test Conference (2007-2009), IEEE International Conference on Computer Design (2004-2009) and IEEE European Test Symposium (2006-2009). She is the general chair for IEEE International Mixed-Signals, Sensors, and Systems. In 2006, Ozev received the NSF CAREER award. She has published over 70 conference and journal papers and holds one US patent.

**Research Interests:** Self-test and self-calibration for wireless transceivers, analysis and mitigation of process variations for mixed-signal and digital circuits, fault-tolerant and reconfigurable heterogeneous systems, mixed-signal circuit testing.

**Honors and Distinctions:** Best paper award in European Test Symposium, 2009. IBM Faculty Award, 2007. NSF CAREER award, 2006. Best paper award, ICCD, 2005. Best Dissertation Award, University of California, San Diego, 2003. VLSI Test Symposium *TTC Naveena Nagi Award*, 2002. *IBM Corporation Co-operative Fellowship Award*, 2000-2002. UCSD *Flaviu Cristian Research Award*, 1999-2001. Vehbi Koc Foundation Award for ranking in the top 30 in the university entrance exam 1990-1995.

#### Selected Publications:

- E. Acar, S. Ozev, "Low-Cost Characterization and Calibration of RF Integrated Circuits through I-Q Data Analysis," *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems*, vol. 28, issue 7, 993-1005, July 2009.
- S. Bahukudumbi, S. Ozev, K. Chakrabarty, V. Iyengar, "Wafer-Level Defect Screening for "Big-D/Small-A" Mixed-Signal SoCs," *IEEE Transactions on Very Large Scale Integration (VLSI) Systems*, vol. 17, issue 4, 587-592, April 2009.



### Joseph Palais

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Joseph Palais joined the faculty in 1964 and is the Electrical Engineering Director of Graduate Studies. He is also Academic Director, Online and Professional Programs for Global Outreach and Extended Education of the Ira A. Fulton School of Engineering. He has published a textbook on fiber optics. The book (in English and in translation) has been used in classes worldwide. He has contributed chapters to numerous books, written over 40 research articles in refereed journals, and presented more than 35 papers at scientific meetings. He has presented over 150 short courses on fiber optics.

**Research Interests:** Fiber optic communications, holography, and distance education.

**Honors and Distinctions:** Daniel Jankowski Legacy Award, IEEE Life Fellow, IEEE EAB Achievement Award, IEEE Phoenix Achievement Award, University Continuing Education Association Conferences and Professional Programs Faculty Service Award.

#### Selected Publications:

- G. Heydt, K. Nigim and J. Palais, "E-Learning Opportunities for Electric Power Engineers," *IEEE Transactions on Power Systems*, vol. 19, no. 3, 1382-1383, August 2007.
- J. Palais, "Long Distance Fiber Optic Communications," Section 3.2 in *The Electrical Engineering Handbook (Broadcasting and Optical Communication Technology)*, Ed. R. C. Dorf, CRC Press and IEEE Press, 3rd ed., 2006.
- J. Palais, "Fiber Optic Communications," Upper Saddle River: Prentice-Hall, 5th ed., 2005. Translations: Korean, Chinese, Persian, Japanese and Syrian.
- C.N. Chen and J. Palais, "Fiber Optical Communications and Applications," Taipei County, Taiwan: New Wun Ching Developmental Publishing Co., 2004.
- J. Palais and K. Tsakalis, "Improving a School's U.S. News and World Report Ranking," *ASEE J. of Engineering Education*, 259-263, July 2004.

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**George Pan**

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George Pan joined the faculty in 1995 as a professor and the director of the Electronic Packaging Laboratory. He has written three book chapters, published 60 research articles in refereed journals and presented 100 papers at national/international conferences. He has presented short courses on wavelets in electromagnetics at Moscow State University, the University of Canterbury, CSIRO in Sydney, IEEE Microwave Symposium, Beijing University, the Chinese Aerospace Institute and 13th Electric Performance of Electronic Packaging (EPEP). His book "Wavelets in Electromagnetics and Device Modeling" (© 2003) was among John Wiley's best-selling titles.

**Research Interests:** Computational electromagnetics, high-speed electronics packaging, magnetic resonant imaging RF coil design and analysis, inverse scattering, rough surface scattering, millimeter-wave antenna systems.

**Honors and Distinctions:** IET Fellow, IEEE Senior Member, Outstanding Paper Award, Government Microcircuit Applications Conference, Nov. 1990.

**Selected Publications:**

- S. Ogurtsov and G. Pan, "An Eigenvalue Based General Dispersion Relation for Conditionally and Unconditionally Stable FDTD Algorithms," *IEEE Trans. Antennas and Propag.*, vol. 56, no. 8, 2572-2583, August 2008.
- Z. Huang, G. Pan, and R. Diaz, "A Hybrid ADI and SBTD Scheme for Unconditionally Stable Time-Domain Solutions of Maxwell's Equations," *IEEE Transactions on Advanced Packaging*, vol. 31, no. 1, 219-226, February 2008.
- S. Ogurtsov, G. Pan, and R. Diaz, "Examination, Clarification and Simplification of Stability and Dispersion Analysis for ADI-FDTD and CNSS-FDTD Schemes," *IEEE Transactions on Antennas & Propagation*, vol. 55, no. 12, 3595-3602, December 2007.
- G. Pan, J. Lin, and G. Cheng, "Wavelet Based Deconvolution Algorithm for Time-Domain Near-Field ISAR Imaging," *IEEE Transactions on Antennas & Propagation*, vol. 55, no. 7, 2013-2021, July 2007.
- X. Xie, G. Pan, and S. Hall, "A Crank Nicholson Based Unconditionally Stable Time Domain Algorithm for 2D and 3D Problems," *Microwave and Optical Technology Letters*, vol. 48, no. 2, 261-265, February 2007.



**Antonia Papandreou-Suppappola**

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Antonia Papandreou-Suppappola joined the ASU faculty as an assistant professor in 1999 and was promoted to associate professor in 2004 and professor in 2008. She is currently the co-director of the Sensor, Signal and Information Processing (SenSIP) Center and the associate director of the Adaptive Intelligent Materials and Systems (AIMS) Center.

She was the lead guest editor for the special issue on waveform-agile sensing and processing for the *IEEE Signal Processing Magazine*, January 2009 issue; editor of the 2002 CRC book on Applications in Time-Frequency Signal Processing; special sessions chair of the 2010 IEEE International Conference of Acoustics, Speech and Signal Processing, in Dallas, TX; general chair of the 2008 Sensor Signal and Information Processing Workshop in Sedona, AZ; associate editor for the *IEEE Transactions on Signal Processing*; technical committee member of the IEEE Signal Processing Society on Signal Processing Theory and Methods (2003-2008); treasurer of the IEEE Signal Processing Society Conference Board (2004-2006).

**Research Interests:** Waveform-agile sensing, time-frequency processing, signal processing for structural health monitoring, biosensing, signal processing for wireless communications.

**Honors and Distinctions:** NSF CAREER Award, 2002; IEEE Phoenix Section Outstanding Faculty for Research Award, 2003; Fulton School of Engineering Teaching Excellence Award, 2005; Top 5% of Fulton School of Engineering Teachers Teaching Excellence Award, May 2009. IEEE Phoenix Section Society Research Award for the SenSIP Center, 2008.

**Selected Publications:**

- Y. Li, S. Sira, A. Papandreou-Suppappola, and D. Morrell, "Waveform Time-Frequency Characterization for Dynamically Configured Sensing," in *Applications and Methods of Waveform Diversity*, SciTech Publishing, Inc., 2009.
- J. Zhang and A. Papandreou-Suppappola, "Time-frequency Based Waveform and Receiver Design for Shallow Water Communications," *IEEE Transactions on Signal Processing*, forthcoming, 2009.

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Stephen M. Phillips received a BS degree in electrical engineering from Cornell University in 1984 and MS and PhD degrees in electrical engineering from Stanford University in 1985 and 1988, respectively. From 1988 to 2002, he served on the faculty of Case Western Reserve University where he held appointments in the Departments of Electrical Engineering and Applied Physics; Systems, Control and Industrial Engineering; and subsequently Electrical Engineering and Computer Science. From 1995 to 2002, he also served as director of the Center for Automation and Intelligent System Research, an industry-university-government collaborative at Case. In 2002, he joined the faculty of Arizona State University as professor of electrical engineering and was appointed department chair in 2005. He has held visiting positions at the NASA Lewis (now Glenn) Research Center and at the University of Washington and is a professional engineer registered in the state of Ohio.

**Research Interests:** Applications and integration of microsystems including microelectromechanical systems (MEMS), microfluidics, microactuators, biological microsystems, neural recording and neural stimulation; applications of systems and control including adaptive control, instrumentation and control of gas-turbine engines, control of microsystems, prosthetics, feedback control over nondeterministic networks.

**Selected Publications:**

- A. T. Al-Hammouri, V. Liberatore, M. S. Branicky, and S. M. Phillips, "Complete Stability Region Characterization for PI-AQM," *SIGBED Review*, vol. 3, no. 2, 1-6, April 2006.
- B. Mi, H. Kahn, F. Merat, A. H. Heuer, D. A. Smith, and S. M. Phillips, "Static and Electrically Actuated Shaped MEMS Mirrors," *Journal of Microelectromechanical Systems*, vol. 14, no. 1, 29-36, 2005.
- B.-K. Lai, H. Kahn, S. M. Phillips, Z. Akase, and A. H. Heuer, "Quantitative Phase Transformation Behavior in TiNi Shape Memory Alloy Thin Films," *Journal of Materials Research*, vol. 19, no. 10, 2822-2833, 2004.



### Gang Qian

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 Assistant Professor, PhD, University of Maryland

Gang Qian joined the ASU faculty in 2003 as an assistant professor jointly with the Arts, Media and Engineering Program and the Department of Electrical Engineering. Previously, he worked as a faculty research assistant and a research associate for the Center for Automation Research at the University of Maryland Institute for Advance Computer Studies. Qian has published over fifty refereed journal articles and conference papers. He is a member of IEEE.

**Research Interests:** Computer vision; multimodal sensing and analysis of human movement and activities with applications in gestural communication, embodied learning, and rehabilitation; robust visual tracking; video-based motion capture and activity recognition

**Honors and Distinctions:** University Guo-Mo-Ruo Golden Medal, USTC, 1994; Educational Institution Award for Outstanding Research Faculty, IEEE Phoenix Section 2005.

#### Selected Publications:

Y. Ma and G. Qian, eds., "Intelligent Video Surveillance: Systems and Technology," Taylor and Francis CRC Press, Jan 2010.

B. Peng, G. Qian and Y. Ma, "Robust View-Invariant Pose Recognition using Multilinear Analysis and Semi-Supervised Learning," In press, Pattern Recognition Letters, 2009.

H. Jin and G. Qian, "Robust Real-Time 3D Object Tracking With Complex Background Visual Projections," EURASIP Journal on Image and Video Processing, 2008.

S. Rangarajan, A. Kidane, G. Qian, and S. Rajko, "Design Optimization of Pressure Sensing Floor for Multimodal Human Computer Interaction," Human Computer Interaction, Ioannis Pavlidis, I-Tech Education and Publishing, Vienna, Austria, October, 2008.

S. Rajko, G. Qian, T. Ingalls, and J. James, "Real-time Gesture Recognition with Minimal Training Requirements and On-line Learning," in Proceedings of IEEE International Conference on Computer Vision and Pattern Recognition, Minneapolis, MN, June 18-23, 2007.

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 Associate Professor, PhD, University of Pennsylvania

Martin Reisslein joined the ASU faculty as an assistant professor in 2000. He received a Dipl.-Ing. in electrical engineering from FH Dieburg, Germany, in 1994, an MS in electrical engineering from the University of Pennsylvania in 1996 and a PhD in systems engineering from the University of Pennsylvania in 1998. He has published over 75 journal articles and over 50 conference papers. He served as editor-in-chief of the IEEE Communications Surveys and Tutorials from 2002 through 2007.

**Research Interests:** Multimedia streaming, multimedia traffic characteristics, metro and access fiber/wireless networks, and engineering education.

**Honors and Distinctions:** NSF CAREER Award, 2002. Editor-in-chief of the IEEE Communications Surveys and Tutorials, 2002-2007. ACM Senior Member, ASEE member, IEEE Senior Member, Informs member, SPIE member. Best Paper Award of Terabit Optical Networking: Architecture, Control, and Management Issues, 2000. Second Best Paper Award of IEEE Consumer Communications and Networking Conference (CCNC), 2006. IEEE Communication Society 2008 Best Tutorial Paper Award.

#### Selected Publications:

C. Chakrabarti, Y. Li and M. Reisslein, "Energy-efficient Video Transmission over a Wireless Link," IEEE Transactions on Vehicular Technology, vol. 58, no. 3, 1229-1244, March 2009.

G. Ozogul, R. Moreno and M. Reisslein, "Optimizing Worked-Example Instruction in Electrical Engineering: The Role of Fading and Feedback during Problem Solving Practice," ASEE Journal of Engineering Education, vol. 98, no. 1, 83-92, January 2009.

B. Kulapala, S. Oh, M. Reisslein and A. Richa, "Continuous-Time Collaborative Prefetching of Continuous Media," IEEE Transactions on Broadcasting, vol. 54, no. 1, 36-52, March 2008.

M. Maier, M. Reisslein, M. Scheutzw and P. Seeling, "Multicast Capacity of Packet-Switched Ring WDM Networks," IEEE Transactions on Information Theory, vol. 54, no. 2, 623-644, January 2008.

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### Armando A. Rodriguez

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Prior to joining the ASU faculty in 1990, Armando A. Rodriguez worked at MIT, IBM, AT&T Bell Laboratories and Raytheon Missile Systems. He has also consulted for Eglin Air Force Base, Boeing Defense and Space Systems, Honeywell and NASA. He has published over 185 technical papers in refereed journals and conference proceedings. He has authored three engineering texts. Dr. Rodriguez has given more than 60 invited presentations at international and national forums, conferences and corporations. Since 1994, he has directed an extensive engineering mentoring-research program that has served over 250 students. He has served as the co-director of an NSF-WAESO funded Bridge to the Doctorate Program involving 12 NSF fellows.

**Research Interests:** Control of nonlinear distributed parameter systems, approximation theory, sampled data and multi-rate control, embedded systems, rapid prototyping, modeling, simulation, animation, and real-time control (MoSART), control of flexible autonomous machines operating in an uncertain environment (FAME), integrated real-time health monitoring, modeling, and reconfigurable fault-tolerant controls; control of bio-economic systems, renewable resources, and sustainable development; control of semiconductor, aerospace, robotic, and low power electronic systems.

**Honors and Distinctions:** AT&T Bell Laboratories Fellowship; Boeing A.D. Welliver Fellowship; CEAS Teaching Excellence Award; IEEE International Outstanding Advisor Award; White House Presidential Excellence Award for Science, Mathematics, and Engineering; ASU Faculty Fellow; ASU Professor of the Year Finalist

#### Selected Publications:

A.A. Rodriguez, J.J. Dickeson, J.J., O. Cifdaloz, R. McCullen, J. Benavides, S. Sridharan, A. Kelkar, J.M. Vogel, and D. Soloway, Modeling and Control of Scramjet-Powered Hypersonic Vehicles: Challenges, Trends, & Tradeoffs, GNC, AIAA-2008-6793, Honolulu, HA, August, 2008.

Rodriguez, A. A. (2008), Control System Design via H2 Optimization, In R. Bishop (Ed.). The Mechatronics Handbook: Mechatronic System Control, Logic, and Data Acquisition (pp.10-1-10-48). Boca Raton, FL: CRC Press.

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**Ronald Roedel**

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 Professor, PhD, UCLA

Ronald Roedel joined the faculty in 1981 and was associate dean of the Ira A. Fulton School of Engineering. He has always tried to carry out research and teaching activities in equal measure. Recently, he has become involved in curriculum reform issues, active-learning strategies and technology-enhanced education. On the research side, he has been involved in semiconductor research for more than 25 years, first with silicon, then with compound semiconductor materials and now with silicon again. He is the author or co-author of 35 publications and has roughly 50 presentations, two book chapters and two patents in the fields of semiconductor characterization and engineering education.

**Research Interests:** Semiconductor materials and devices with a special interest in modeling devices made from large bandgap materials, engineering pedagogy with a special interest in distance learning.

**Honors and Distinctions:** ASU College of Engineering Teaching Excellence Award three times, NSF Presidential Young Investigator Award, 1984; and the ASU Parents Association Professor of the Year Award, 1999.

**Selected Publications:**

- R.J. Roedel, D. Evans, S.M. Goodnick, "ECE Curriculum in 2013 and Beyond: Vision for Metropolitan Public Research University," IEEE Trans. Education, 46, 508, 2003
- K. Gonzalez-Landis, P. Flikkema, V. Johnson, J. Palais, E. Penado, R. J. Roedel, and D. Shunk, "The Arizona Tri-university Master of Engineering Program," Proceedings of the Frontiers in Education (FIE) Conference, Boston, MA, November 2002.
- S. Duerden, J. Garland, C. Helfers, and R.J. Roedel, "Integrated Programs and Cultural Literacies: Using Writing to Help Engineering Students Transition to the Cultural Literacies of College," Proceedings of the American Society of Engineering Education (ASEE) Conference, Montreal, Quebec, CA, June 2002.
- R.J. Roedel, "Light Emitting Diodes," Encyclopedia of Materials Research, Elsevier Publishing, 2002.

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**Marco Saraniti**

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From 1996 to 1998, Marco Saraniti was a Faculty Research Associate with the Electrical Engineering Department of Arizona State University. He joined the Electrical and Computer Engineering Department of the Illinois Institute of Technology, Chicago, in 1998, where he was awarded the tenure in 2004. He is the author or coauthor of more than 90 publications, four book chapters, and four technical reports. His current research focuses mainly on computational electronics applied to the simulation of semiconductor devices and biological structures. His recent scientific work covers the following fields: the development of Monte Carlo and cellular automaton techniques for 2-D and 3-D simulation of semiconductor devices, simulation and engineering of semiconductor devices, and the development of numerical methods for the modeling and simulation of membrane proteins.

**Research Interests:** Computational electronics and biophysics

**Selected Publications:**

- D. Marreiro, Y. Tang, S. Aboud, E. Jakobson, and M. Saraniti, "Improving the Efficiency of BD Algorithms for Biological Systems Simulations," Journal of Computational Electronics, vol. 6, 377-380, 2007.
- M. Saraniti, S. Aboud, J. Branlard, and S. M. Goodnick, "Particle-based simulation: An algorithmic perspective," Journal of Computational Electronics, vol. 6, 405-410, 2007.
- J. Ayubi-Moak, D. K. Ferry, S. M. Goodnick, R. Akis, and M. Saraniti, "Simulation of Ultrasubmicrometer-Gate  $In_{0.5}Al_{0.48}As/In_{0.75}Ga_{0.25}As/In_{0.52}Al_{0.48}As/InP$  Pseudomorphic HEMTs Using a Full-Band Monte Carlo Simulator," IEEE Trans. El. Dev., vol. 54, issue 9, 2327 - 2338, 2007.
- D. Marreiro, M. Saraniti, and S. Aboud, "Brownian dynamics simulation of charge transport in ion channels," J. Phys.: Condens. Matter, vol.19, no. 21, 215203, 2007.
- S. M. Goodnick and M. Saraniti, "Cellular Monte Carlo simulation of High Field Transport in Semiconductor Devices," International Journal of High Speed Electronics and Systems, vol. 17, no.3, 465-473, 2007.



**Dieter K. Schroder**

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 Regents' Professor, PhD, University of Illinois

Dieter Schroder joined the ASU faculty in 1981 after 13 years at the Westinghouse Research Labs. He has published two books, 176 journal articles, nine book chapters, and 167 conference presentations, edited 11 books, holds five patents and has graduated 61 MS students and 41 PhD students.

**Research Interests:** Semiconductor devices, photovoltaics, defects in semiconductors, semiconductor material and device characterization, electrical/lifetime measurements, low-power electronics, device modeling, MOS devices.

**Honors and Distinctions:** IEEE Life Fellow, IEEE van der Ziel Award, 2007, Distinguished National Lecturer for the IEEE Electron Device Society, 1993-2007; ASU College of Engineering Teaching Excellence Award, 1989, 1998, 2001; National Technical University Outstanding Instructor, 1991-2003; University Continuing Education Association Faculty Service Award, 1997; ASU College of Extended Education Distance Learning Faculty Award, 1998; IEEE Meritorious Achievement Award in Continuing Education Activities, 1998; IEEE Phoenix Section: Outstanding Faculty Member, 2000.

**Selected Publications:**

- D.K. Schroder, "Nano Characterization of Materials," Int. J. High Speed Electron. Syst. 18, 861-878, Dec. 2008.
- D.H. Baek, S.B. Kim and D.K. Schroder, "Epitaxial Silicon Minority Carrier Diffusion Length by Photoluminescence," J. Appl. Phys. 104, 054503 1-5, Sept. 2008.
- V. Kushner, K. Park, D. K. Schroder, and T. J. Thornton, "Low Frequency Noise Spectroscopy of SIMOX and Bonded SOI Wafers," IEEE Trans. Electron Dev., 54, 3378-3382, December 2007.
- K. Park, M. Canonico, G.K. Celler, M. Seacrist, J. Chan, J. Gelpey, K. Holbert, S. Nakagawa, M. Tajima, and D.K. Schroder, "Effects of High Temperature Anneals and 60Co Gamma Ray Irradiation on Strained Silicon-on-Insulator (sSOI)," J. Appl. Phys., 102, 074507 1-5, October 2007.

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### Jennie Si

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Jennie Si received her BS and MS degrees from Tsinghua University, Beijing, China, and her PhD from the University of Notre Dame, all in electrical engineering. She joined the ASU faculty in 1991 where she is currently a professor.

**Research Interests:** Learning and approximation based dynamic programming for nonlinear dynamic system optimization, cortical information processing and motor cortical brain-machine interface, pattern analysis and machine intelligence for tracking applications.

**Honors and Distinctions:** Listed in many Marquis Who's Who publications since late 1990s. NSF/White House Presidential Faculty Fellow, 1995, Motorola Excellence Award, 1995, NSF Research Institution Award, 1993, IEEE Fellow, 2008. Past associate editor of IEEE Transactions on Automatic Control, IEEE Transactions on Semiconductor Manufacturing, and IEEE Transactions on Neural Networks. Current associate editor of Neural Networks, the official journal of the International Neural Networks Society. General Chair of the 2007 International Joint Conference on Neural Networks. One of the 10 students who received the highest honor at Tsinghua University in Beijing, China, 1984.

### Selected Publications:

- L. Yang, J. Si, K. Tsakallis, and A. Rodriguez, "Direct Heuristic Dynamic Programming for Nonlinear Tracking Control with Filtered Tracking Error," IEEE Transactions on Systems, Man, and Cybernetics, Part B. 2009.
- L. Yang, J. Si, K. Tsakallis, and A. Rodriguez, "Performance evaluation of direct heuristic dynamic programming using control-theoretic measures," Journal of Intelligent and Robotic Systems, 2009.
- L. Yang, J. Dankert, and J. Si. "A performance gradient perspective on gradient-based policy iteration and a modified value iteration," International Journal of Intelligent Computing and Cybernetic, 1:4, 509-520, December 2008.
- B. Li, C. Li, J. Si, and G. Abousleman, "Interval Least-Squares Filtering with Applications to Video Target Tracking," Optical Engineering, 47:10, 106401-14, October 2008.

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Brian Skromme joined the ASU faculty in 1989, where he is presently a professor in solid-state electronics. From 1985 to 1989, he was a member of the technical staff at Bellcore. He has written over 120 refereed publications in solid-state electronics.

**Research Interests:** Compound semiconductor materials and devices, especially wide bandgap materials for optoelectronic, high-frequency, high-power, and high-temperature applications; optical characterization of semiconductor materials, development of GaN and SiC-based materials and devices.

**Honors and Distinctions:** Eta Kappa Nu, Young Faculty Teaching Award, 1990-1991; Golden Key National Honor Society Outstanding Professor Award, 1991; listed in Who's Who in Science and Engineering and Who's Who in Engineering Education.

### Selected Publications:

- A. Mahajan and B. J. Skromme, "Design and Optimization of Junction Termination Extension (JTE) for 4H-SiC High Voltage Schottky Diodes," Solid State Electron, 49, 945-955, 2005.
- L. Chen, B. J. Skromme, R. F. Dalmau, R. Schlessler, Z. Sitar, C. Chen, W. Sun, J. Yang, M. A. Khan, M. L. Nakarmi, J. Y. Lin, and H.-X. Jiang, "Band-edge Exciton States in AlN Single Crystals and Epitaxial Layers," Appl. Phys. Lett. 85, 4334-4336, 2004.
- L. Chen and B.J. Skromme, "Spectroscopic Characterization of Ion-Implanted GaN," in GaN and Related Alloys, 2002, eds. E.T. Yu, Y. Arakawa, A. Rizzi, J.S. Speck, and C.M. Wetzel, MRS Proceedings, vol. 743, L11.35.1-L11.35.6, Warrendale, PA, 2003.
- B. J. Skromme, K. Palle, C. D. Poweleit, L. R. Bryant, W. M. Vetter, M. Dudley, K. Moore, and T. Gehoski, "Oxidation-Induced Crystallographic Transformation in Heavily N-Doped 4H-SiC Wafers," Mater. Sci. Forum, vols. 389-393, 455-458, 2002.
- B. J. Skromme, E. Luckowski, K. Moore, M. Bhatnagar, C. E. Weitzel, T. Gehoski, and D. Ganser, "Electrical Characteristics of Schottky Barriers on 4H-SiC: The Effects of Barrier Height Nonuniformity," J. Electron. Mater., vol. 29, 376-383, 2000.



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 Professor, PhD, West Virginia University

Andreas Spanias joined the ASU faculty in 1988. He has published more than 55 journal and 160 conference papers and contributed several book chapters. He authored two text books in DSP and Speech and Audio Coding. He has served as associate editor of IEEE Transactions on Signal Processing, as the general co-chair of the 1999 IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP-99) and as vice-president for the IEEE Signal Processing Society. He and former PhD student Ted Painter received the prestigious 2002 IEEE Donald G. Fink Prize Paper Award for their IEEE Proceedings paper entitled "Perceptual Coding of Digital Audio." He was also the recipient of the 2005 IEEE Signal Processing Society Meritorious Service Award. In addition, Professor Spanias is an IEEE Fellow and served as IEEE Distinguished Lecturer in 2004. He is currently associate director of the ASU Arts, Media and Engineering (AME) program, Director of the SenSip Industry Consortium, PI of a multi-university NSF program and Co-PI on a major NSF IGERT program.

**Research Interests:** Digital signal processing, multimedia signal processing, speech and audio coding, adaptive filters, real-time processing of sensor data, signal processing for the arts.

**Honors and Distinctions:** IEEE Fellow, IEEE Distinguished Lecturer, Donald G. Fink Prize for paper titled "Perceptual Coding of Digital Audio," 2002; Intel Advanced Personal Communications Division-Central Logic Engineering Award, 1997; Intel Research Council: Natural Data Types Committee Award, 1996; Intel Corporation Award for Leadership and Contributions to the 60172 Processor Architecture, 1993. Author of J-DSP software (<http://jdsp.asu.edu>) ranked in the top three educational resources in 2003 by the UC-Berkeley NEEDS panel.

### Selected Publications:

- S. Sabesan, L.B. Good, K. Tsakalis, A. Spanias, D.M. Treiman and L. D. Iasemidis, "Information flow and application to epileptogenic focus localization from intracranial EEG", IEEE Trans. Neural Systems and Rehab. Eng., pp. 244-253, June 2009

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Nongjian Tao joined the ASU faculty as a professor of electrical engineering and an affiliated professor of chemistry and biochemistry in August 2001. Before that, he worked as an assistant and associate professor at Florida International University. He holds five U.S. patents, has published 170 refereed journal articles and book chapters and has given over 170 invited talks and seminars worldwide.

**Research Interests:** Molecular electronics, nanostructured materials and devices, chemical and biological sensors, interfaces between biological molecules and solid materials, and electrochemical nanofabrications.

**Honors and Distinctions:** Alexander von Humboldt Research Award, Hellmuth Fisher Medal, Excellence in Research Award (2000), Florida International University, AzTE Innovator of the Year (2006), Molecular Imaging Young Microscopist.

**Selected Publications:**

- J.L. Xia, Isma, NJ Tao, "Electron Transport in Single Molecules Measured by a Distance-Modulation Assisted Break Junction Method," *NanoLett.*, 8, 1960-1964, 2008.
- Z.F. Huang, F. Chen, R. D'Agosta, P. A. Bennett, M. Di Venira and N.J. Tao, "Local-Heating in Single Molecule Junctions: Evidence of Electron-Phonon and Electron-Electron Interactions, *Nature Nanotechnology*, 2, 698-703, 2007.
- N.J. Tao, "Electron transport in molecular junctions", *Nature Nanotech.*, 1, 173-181, 2006.
- J. Hihath, B. Q. Xu, P. M. Zhang, and N. J. Tao, "Study of Nucleotide Polymorphisms via Electrical Conductance Measurements," *Proc. Natl Acad. Sci.*, 102, 16979-16983, 2005.
- E.S. Forzani, H.Q. Zhang, L.A. Nagahara, I.Amlani, R. Tsui, N.J. Tao "Conducting Polymer Nanojunction Sensor for Glucose Detection," *NanoLett.*, 4, 1785-1788, 2004.
- B.Q. Xu and N. J. Tao, "Measurement of Single Molecule Conductance by Repeated Formation of Molecular Junctions," *Science*, vol. 301, 1221-1223, 2003.

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Cihan Tepedelenioglu joined the ASU faculty as an assistant professor in July 2001. He received his BS from the Florida Institute of Technology in 1995, an MS from the University of Virginia in 1998 and a PhD from the University of Minnesota in 2001, all in electrical engineering. In 2001, he received the NSF CAREER award.

**Research Interests:** Wireless communications, statistical signal processing, estimation and equalization algorithms for wireless systems, filterbanks and multirate systems, carrier synchronization for OFDM systems, power estimation and handoff algorithms, space-time coding, ultrawideband communications.

**Honors and Distinctions:** NSF CAREER Award, 2001, Member Tau Beta Pi.

**Selected Publications:**

- N. He and C. Tepedelenioglu, "Joint Pulse and Symbol Level Acquisition of UWB Receivers", *IEEE Transactions on Wireless Commun.*, vol. 7, no. 1, 6-14, January 2008.
- C. Tepedelenioglu, M. Banavar, and A. Spanias, "Asymptotic analysis of distributed estimation over fading multiple access channels," *Asilomar Conference on Signals Systems and Computers*, Monterrey, CA, November 2007.
- Q. Ma and C. Tepedelenioglu, "Antenna selection for space-time coded systems with imperfect channel estimation," *IEEE Transactions on Wireless Commun.*, vol. 6, no. 2, 710 – 719, February 2007.
- P. Gao and C. Tepedelenioglu, "Space-time coding over fading channels with impulsive noise," *IEEE Transactions on Wireless Commun.*, vol. 6, no. 1, 220 – 229, January 2007.

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**Harvey Thornburg**

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Dr. Harvey Thornburg joined the ASU faculty in August 2005 with a joint appointment in AME/EE. His current research activities comprise a) audio sensing, b) multimodal human activity analysis, c) continuous archival and retrieval of multimedia events, and d) signal processing for human-computer interaction. Thornburg serves as Co-Director of the K-12 Mediated Education Project (with Dr. Birchfield) which has developed the Situated Multimedia Arts Learning Laboratory (SMALLab), a new multimodal computationally mediated platform for K-12 education. SMALLab has positively impacted hundreds of students in local schools and programs in the Phoenix metropolitan area and has received extensive press coverage. Other projects include Enactive Arts (in collaboration with Profs. Ingalls, James, Campana and Qian) and SIRENS (Segmentation, Indexing, and Retrieval of Environmental and Natural Sound).

**Research Interests:** Audio signal processing and content analysis, music information retrieval, human motion analysis and gesture segmentation, signal processing for human-computer interaction.

**Selected Publications:**

- D. Swaminathan, H. Thornburg, J. Mumford, S. Rajko, J. James, T. Ingalls, E. Campana, G. Qian, P. Sampath, and B. Peng, "A Dynamic Bayesian Approach to Laban Shape Quality Analysis," *Journal of Advances in Human-Computer Interaction*, 362651, Hindawi Press, 2009.
- D. Birchfield, H. Thornburg, C. Megowan-Romanowicz, S. Hutton, B. Mechtley, I. Dolgov, and W. Burleson, "Embodiment, Multimodality, and Composition: Convergent Themes Across HCI and Education for Mixed-Reality Learning Environments," *Journal of Advances in Human-Computer Interaction*, Hindawi Press, 2009.
- D. Swaminathan, H. Thornburg, T. Ingalls, S. Rajko, J. James, E. Campana, K. Afanador and R. Leistikow, "Capturing Expressive and Indicative Qualities of Conducting Gesture: An Application of Temporal Expectancy Models," in *Lecture Notes in Computer Science #3349: Computer Music Modeling and Retrieval*, 34-55, Springer Verlag 2008.
- K. Tu, H. Thornburg, E. Campana, D. Birchfield, M. Fulmer and A. Spanias, "Interaction and reflection via 3D path shape qualities in a mediated constructive learning environment," in *Proceedings of ACM EMME 07*, 37-46, Augsburg, Germany, 2007.



## Trevor Thornton

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Trevor Thornton joined the faculty in 1998 after having spent eight years at Imperial College in London and two years as a member of the technical staff at Bell Communications Research, New Jersey. He invented the split-gate transistor, which was used to demonstrate the quantization of the ballistic resistance. He is currently the Director of the Center for Solid State Electronics Research which manages the ASU NanoFab, the Southwest regional node of the NSF supported National Nanofabrication Infrastructure Network.

**Research Interests:** Nanostructures, molecular electronics and sensors, micro-electro-mechanical systems (MEMS), silicon-on-insulator MESFETs.

**Honors and Distinctions:** Recipient of ASU Co-Curricular Programs Last Lecture Award, 2001.

### Selected Publications:

- W. Lepkowski, J. Ervin, S. J. Wilk, and T. J. Thornton, "SOI MESFETS Fabricated Using Fully Depleted CMOS Technologies," *IEEE Electron Device Letters*, vol. 30, 678 - 680, 2009.
- B. R. Takulapalli, G. M. Laws, P. A. Liddell, J. Andreasson, Z. Erno, D. Gust, and T. J. Thornton, "Electrical Detection of Amine Ligation to a Metalloporphyrin via a Hybrid SOI-MOSFET," *J. Am. Chem. Soc.*, vol. 130, 2226 - 2233, 2008.
- S.J. Wilk, L. Petrossian, M. Goryll, T.J. Thornton, S. M. Goodnick, J. M. Tang, and R. S. Eisenberg "Integrated Electrodes on a Silicon Based Ion Channel Measurement Platform," *Biosensors and Bioelectronics*, vol. 23, 183-190, 2007.
- L. Petrossian, S. Wilk, P. Joshi, S. Hihath, S. Goodnick, and T. Thornton, "Fabrication of Cylindrical Nanopores and Nanopore Arrays in Silicon-on-insulator Substrates," *J. Microelectromechanical Systems*, vol. 16, 1419 - 1428, 2007.
- J. Ervin, A. Balijepalli, P. Joshi, V. Kushner, J. Yang, and T. J. Thornton, "CMOS-Compatible SOI MESFETs With High Breakdown Voltage," *IEEE Transactions on Electron Devices*, vol. 53, 3129-3135, 2006.

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Konstantinos Tsakalis joined the ASU faculty in 1988 and is currently a professor. He received his MS in chemical engineering in 1984, an MS in electrical engineering in 1985, and a PhD in electrical engineering in 1988, all from the University of Southern California. He holds several patents and has published one book and 143 journal and 98 conference papers.

**Research Interests:** Applications of control, optimization, and system identification theory to semiconductor manufacturing, chemical process control, and prediction and control of epileptic seizures.

**Honors and Distinctions:** Licensed chemical engineer, Technical Chamber of Greece; member IEEE, Sigma Xi.

### Selected Publications

- N. Chakravarthy, K. Tsakalis, S. Sabesan and L. Iasemidis, "Homeostasis of Brain Dynamics in Epilepsy: A Feedback Control Systems Perspective of Seizures," *Annals of Biomedical Engineering*, vol. 37, 3, 565-585, 2009.
- N. Chakravarthy, S. Sabesan, K. Tsakalis and L. Iasemidis, "Controlling epileptic seizures in a neural mass model," *Journal of Combinatorial Optimization, Springer Sci. and Bus. Media*, 17:98-116, January 2009.
- S. Sabesan, N. Chakravarthy, K. Tsakalis and L.D. Iasemidis, "Measuring resetting of brain dynamics at epileptic seizures: Application of global optimization and spatial synchronization techniques," *Journal of Combinatorial Optimization, Springer Sci. and Bus. Media*, 17: 74-97, January 2009.
- V. Atti, A. Spanias, K. Tsakalis, C. Panayiotou, L. Iasemidis and V. Berisha, "Gradient Projection-Based Channel Equalization Under Sustained Fading," *Signal Processing*, vol. 88, 2, 236-246, February 2008.
- K. Tsakalis and L. Iasemidis, "Control Aspects of a Theoretical Model for Epileptic Seizures," *International Journal of Bifurcation and Chaos*, 16 :7, 2013-2027, July 2006.
- N. Chakravarthy, K. Tsakalis, L. Iasemides, and A. Spanias, "A Multidimensional Scheme for Controlling Unstable Periodic Orbits in Chaotic Systems," *Physics Letters A*, 349, 116-127, 2006.

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## Daniel Tylavsky

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Daniel Tylavsky is internationally known for applying computation technology to the analysis and simulation of large-scale power-system generation/transmission problems. He also is an avid educator who uses team/cooperative learning methods in graduate and undergraduate education and is a pioneer in the use of mediated classrooms. He has been responsible for more than \$3.5 million in research funding for both technical and educational research projects. He is a member of several honor societies and has received numerous awards for his technical work, as well as for work with student research.

**Research Interests:** Electric power systems, numerical methods applied to large-scale system problems, parallel numerical algorithms, new educational methods and technologies, applying social optimization to power system markets, and transformer thermal modeling.

**Honors and Distinctions:** Senior Member of IEEE, IEEE-PES Certificate for Outstanding Student Research Supervision (three times), six awards for outstanding research from the IEEE-IAS Mining Engineering Committee, various awards for outstanding teaching.

### Selected Publications:

- J. Cardell, I. Dobson, W. Jewell, M. Kezunovic, T. Overbye, P. K. Sen, and D. J. Tylavsky, "The Electric Power Industry and Climate Change: U.S. Research Needs," *Climate Change Panel Paper for the PES General Meeting Summer 2008*.
- L. Jauregui Rivera and D. J. Tylavsky, "Acceptability of Four Transformer Thermal Models Pt 2: Comparing Metrics," *IEEE Transactions on Power Delivery*, v. 23, no. 2, 860-865, April 2008.
- L. Jauregui Rivera, and D. J. Tylavsky, "Acceptability of Four Transformer Thermal Models Pt 1: Defining Metrics," *IEEE Transactions on Power Delivery*, vol. 23, no. 2, 866-872, April 2008.
- X. Mao, D. J. Tylavsky, N. Logic, "Non-Collocated Measurement Error and Sign Error Identification to Enhance State Estimator," *2007 North American Power Symposium*, 404-410, September 2007.





**Dragica Vasileska**

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 Professor, PhD, Arizona State University

Dragica Vasileska joined the ASU faculty in August 1997. She has published over 120 journal articles in prestigious refereed journals, 15 book chapters and 60 articles in conference proceedings in the areas of solid-state electronics, transport in semiconductors, and semiconductor device modeling. Together with Prof. Goodnick, she has co-authored a book entitled Computational electronics. She has also given numerous invited talks. She is a senior member of IEEE, the American Physical Society and Phi Kappa Phi.

**Research Interests:** Semiconductor device physics, semiconductor transport, 1-D to 3-D device modeling, quantum field theory and its application to real device structures, spin transport, heating effects in nano-scale devices, current collapse in GaN HEMTs.

**Honors and Distinctions:** Listed in Who's Who 2007, NSF CAREER Award, 1998; University Cyril and Methodius, Skopje, Republic of Macedonia, College of Engineering Award for Best Achievement in One Year, 1981-1985; University Cyril and Methodius, Skopje, Republic of Macedonia, Award for Best Student from the College of Engineering in 1985 and 1990.

**Selected Publications:**

A. Ashwin, D. Vasileska, O. Hartin and S. M. Goodnick, "Importance of the Gate-Dependent Polarization Charge on the Operation of GaN HEMTs," IEEE Transactions on Electron Devices, vol. 56, 998-1006, May 2009.  
 K. Raleva, D. Vasileska, S. M. Goodnick and M. Nedjalkov, "Modeling Thermal Effects in Nanodevices," IEEE Transactions on Electron Devices, vol. 55, issue 6, 1306-1316, June 2008.  
 H. R. Khan, D. Mamaluy, and D. Vasileska, "Quantum Transport Simulation of Experimentally Fabricated Nano-FinFET," IEEE Transactions on Electron Devices, vol. 54 (4), 784-796, 2007.  
 S. Krishnan, D. Vasileska, and M. Fischetti, "First Self-Consistent Full Band – 2D Monte Carlo – 2D Poisson Device Solver for Modeling SiGe p-Channel Devices," J. Vac. Sci. Technol. B, vol. 24(4), 1997-2003, 2006.

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**Vijay Vittal**

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 Professor, Ira A. Fulton Chair in Electrical Engineering, PhD, Iowa State University

Vijay Vittal joined the ASU faculty in 2005. Prior to ASU, he was an Anston Marston Distinguished Professor at the Iowa State University's, Electrical and Computer Engineering Department. In addition, Dr. Vittal was a Murray and Ruth Harpole Professor and director of the university's Electric Power Research Center and site director of the National Science Foundation IUCRC Power System Engineering Research Center. He also served as the program director of power systems for the National Science Foundation Division of Electrical and Communication Systems in Washington, D.C., from 1993 to 1994. He currently is the director of the National Science Foundation IUCRC Power System Engineering Research Center. He is the editor-in-chief of the IEEE Transactions on Power Systems. He has published 108 articles in refereed journals, 97 refereed conference proceeding articles, nine books and book chapters and 13 research and technical reports.

**Research Interests:** Electric power, power system dynamics and controls, nonlinear systems, computer applications in power, sustainable energy, modeling and simulation of complex systems.

**Honors and Distinctions:** Member, National Academy of Engineering, 2004; Iowa State University College of Engineering Anson Marston Distinguished Professor, 2004; Iowa State University Foundation Award for Outstanding Achievement in Research, 2003; Institute of Electrical and Electronics Engineers, Power Engineering Society Technical Council Committee of the Year Award, 2000-2001; Outstanding Power Engineering Educator Award, Power Engineering Society, Institute of Electrical and Electronics Engineers, 2000; Warren B. Boast Undergraduate Teaching Award, 2000.

**Selected Publications:**

R. Diao, K. Sun, V. Vittal, R.J. O'Keefe, M.R. Richardson, N. Bhatt, D. Stradford, and S.K. Sarawagi, "Decision Tree-Based Online Voltage Security Assessment Using PMU Measurements," IEEE Transactions on Power Systems, vol. 24, no. 2, 832-839, May 2009.

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**Bingsen Wang**

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Bingsen Wang joined the ASU faculty in January 2008. Prior to joining ASU, Dr. Wang worked with General Electric Global Research Center, where he actively conducted research in various aspects of power electronics, mainly focused on ac power conversion in the high-power area. He currently works in the research area of power electronics and its application to renewable energy, utility and electric drives.

**Research Interests:** Power converter topologies, in particular, multilevel converters and matrix converters; modulation and control of power electronic systems; application of power electronics to renewable energy systems, power conditioning, FACTS, and electric drives.

**Honors and Distinctions:** Senior Member of IEEE; Member of Sigma Xi; Prize Paper Award, IEEE IAS Industrial Power Converter Committee, 2006; Session Chair of IEEE IAS Annual Meeting, 2008.

**Selected Publications:**

B. Wang and G. Venkataramanan, "Dynamic voltage restorer utilizing a matrix converter and flywheel energy storage," IEEE Transactions on Industry Applications, vol. 45, no. 1, 222-231, 2009.  
 R. Lai, F. Wang, R. Burgos, Y. Pei, D. Boroyevich, B. Wang, T. A. Lipo, V. D. Immanuel, and K. Karimi, "A systematic topology evaluation methodology for high-density three-phase PWM ac-ac converters," IEEE Transactions on Power Electronics, vol. 23, no. 6, 2665-2680, 2008.  
 B. Wang, G. Venkataramanan, and A. Bendre, "Unity power factor control for three phase three level rectifiers without current sensors," IEEE Transactions on Industry Applications, vol. 43, no. 5, 1341-1348, 2007.  
 B. Wang, G. Venkataramanan, and M. Illindala, "Operation and control of a dynamic voltage restorer using transformer coupled H-bridge converters," IEEE Transactions on Power Electronics, vol. 21, no. 4, 1053-1061, 2006.  
 B. Wang and G. Venkataramanan, "A carrier based PWM algorithm for indirect matrix converters," Proceedings of 37th IEEE Power Electronics Specialists Conference, 2780-2787, Jeju, Korea, June 18-22, 2006.

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### Hongbin Yu

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Hongbin Yu joined the ASU faculty in 2005. He received his PhD in physics in 2001 from the University of Texas at Austin, and his MS in physics in 1996 from Peking University, P.R. China, and conducted his post-doctoral research at California Institute and Technology and University of California at Los Angeles.

**Research Interests:** Nanostructure and nano device fabrication and characterization, transport in metallic and semiconducting nanostructures and molecules, quantum size effect in metallic and semiconducting nanostructures, surface and interface physics and chemistry.

**Honors and Distinctions:** Graduate Research Award, American Vacuum Society, 2001.

### Selected Publications:

- Wei Xu, Alan Chin, Laura Ye, Cun-Zheng Ning and H. Yu, "Electrical and optical characterization of individual GaSb nanowires," *Proc. of SPIE*, vol. 7224, 72240G, 2009.
- D. Eom, C.-S. Jiang, H. Yu, J. Shi, Q. Niu, Ph. Ebert, and C.-K. Shih, "Scanning Tunneling Spectroscopy of Ag films: The Effect of Periodic vs. Quasiperiodic Modulation," *Phys. Rev. Lett.*, 97, 206102, 2006.
- H. Yu, L. J. Webb, J. R. Heath, and N. S. Lewis, "Scanning Tunneling Spectroscopy of Methyl- and Ethyl- terminated Si(111) Surfaces," *Appl. Phys. Lett.* 88, 252111, 2006.
- S. D. Solares, H. Yu, L. J. Webb, N. S. Lewis, J. R. Heath, and W. A. Goddard III, "Chlorination-Methylation of the Hydrogen-Terminated Silicon(111) Surface Can Induce a Stacking Fault in the Presence of Etch Pits," *J. Am. Chem. Soc.* 128, 3850, 2006.
- H. Yu, L. J. Webb, R. S. Ries, S. D. Solares, W.A. Goddard III, J. R. Heath, and N. S. Lewis, "Low Temperature STM Images of Methyl-Terminated Si(111) Surfaces," *J. Phys. Chem. B*, 109, 671, 2005.
- T. Feng, H. Yu, M. Dicken, J. R. Heath, and H. A. Atwater, "Probing the Size and Density of Silicon Nanocrystals in Nanocrystal Memory Device Applications," *Appl. Phys. Lett.*, 86, 033103, 2005.
- C. S. Jiang, S. C. Li, H. Yu, D. Eom, X. D. Wang, P. Ebert, J. F. Jia, Q. K. Xue, and C. K. Shih, "Building Pb Nanomesas with Atomic-layer Precision," *Phys. Rev. Lett.*, 92, 106104, 2004.



### Hongyu Yu

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Hongyu Yu joined the ASU faculty in 2008 holding a joint position between Electrical Engineering and School of Earth and Space Exploration. He received his BS and MS degrees in electronics engineering from Tsinghua University, Beijing, China, in 1997 and 2000, respectively, and a PhD degree in electrical engineering from the University of Southern California in 2005.

His research area is focused on MicroElectroMechanical Systems (MEMS) for Earth and Space Exploration. His goal is to provide miniaturized portable platforms and instruments for Earth and Space scientists to explore variety of missions and projects, such as seismology, biogeochemistry, volcanology, and astrobiology, including wireless sensing, energy harvesting, microfluidic analysis systems, acoustic transducers, wireless communication, micro fuel cells and supercapacitors. His current projects include: miniature seismometers for Earth and Moon exploration, flexible and stretchable shear stress sensor for river and hot spring monitoring, wireless UV and IR sensing, 3D MEMS/NEMS manufacturing and self focused acoustic actuators for gene therapy.

**Research Interests:** Wireless sensing and communication, microfluidic analysis systems, acoustic transducers, micro seismometer, accelerometer, and mass spectrometer.

### Selected Publications:

- X. Qiu, J. Zhu, J. Oiler, C. Yu, Z. Wang, and H. Yu, "Film Bulk Acoustic-Wave Resonator Based Ultraviolet Sensor," *Applied Physics Letter*, vol. 94, 16 DOI: 10.1063/1.3122342, 2009.
- H. Yu, C.Y. Lee, W. Pang, H. Zhang, A. Brannon, J. Kitching, E.S. Kim, et al., "HBAR-Based 3.6 GHz Oscillator with Low Power Consumption and Low Phase Noise," *IEEE Transactions on Ultrasonics Ferroelectrics and Frequency Control*, 56:2, 400-403, 2009.
- H. Yu, L.S. Ai, M. Rouhanizadeh, D. Patel, E.S. Kim, T.K. Hsiai, "Flexible Polymer Sensors for In Vivo Intravascular Shear Stress Analysis," *Journal of Microelectromechanical Systems*, 17:5, 1178-1186, 2008.
- C.Y. Lee, H. Yu, W. Pang, and E.S. Kim, "Droplet-Based Microreactions with Oil Encapsulation," *Journal of Microelectromechanical systems*, vol. 17, issue 1, 147-156, 2008.



### Frederic Zenhausern

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 Professor, PhD, MBA, University of Geneva, Switzerland

Frederic Zenhausern has a joint faculty appointment as full professor with the Department of Electrical Engineering and the School of Materials. He is the founder, director and professor at the Center for Applied Nanobioscience at the Bidesign Institute. He is a co-investigator at the Center for Flexible Display. Zenhausern received his BS in biochemistry from the University of Geneva, his MBA in finance from Rutgers University and his PhD in applied physics from the Department of Condensed Physics Matter at the University of Geneva. He has co-authored over 70 scientific publications and has published more than a dozen U.S. patents. Dr. Zenhausern is Senior Investigator & Associate Director Molecular Diagnostics & Target Validation Division at the Translational Genomics Research Institute (TGen) and co-founded Nanobionics Inc, a merger company with the Molecular Profiling Institute, acquired by Caris Diagnostics in December 2007. He also has an adjunct appointment with the Mayo Cancer Center and the Arizona Cancer Center. He co-founded the MAC5 joint laboratory between ASU and Mayo Clinic Scottsdale.

**Honors and Distinctions:** Patent Committee, Solid State Res. Ctr., Motorola Labs, 1999-2002; Received 3 Patent Silver Quill Awards from Motorola Labs, Scientific Advisor Molecular Profiling Institute; Recipient of the Award of the Life Sciences Startup of the Year 2005 from the Arizona Bioindustry Association, Finalist of the 2004 Governor's Celebration of Innovation Award (Innovator of the Year: Academia)

### Selected Publications:

- J. Gu, R. Gupta, C.-F. Chou, Q. Wei, and F. Zenhausern, "A Simple Polysilsesquioxane Sealing of Nanofluidic Channels Below 10 nm at Room Temperature," *Lab Chip*, June 29, 2007.
- J. Wang, J. Gu, F. Zenhausern, and H. Siringhaus, "Low-cost Fabrication of Submicron all Polymer Field Effect Transistors," *Applied Physics Letters*, 88, 133502, 2006.
- J. Gu, C. P. Chen, Q. Wei, C.F. Chou, and F. Zenhausern, "Mask Fabrication Towards sub-10 nm Imprint Lithography," *Journal of MicroLithography*, 213-218, 2005.

**Junshan Zhang**

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 Associate Professor, PhD, Purdue University

Junshan Zhang joined the ASU faculty as an assistant professor in August 2000. He received a BS in electrical engineering from HUST, China in July 1993, an MS in statistics from the Univ. of Georgia in December 1996, and a PhD in electrical and computer engineering from Purdue University in 2000. He is the recipient of a 2003 NSF CAREER Award and a 2005 ONR YIP award. He won the 2003 Faculty Research Award from the IEEE Phoenix Section. He served as TPC co-chair for WICON 2008, IPCCC 2006 and TPC vice chair for ICCCN 2006. He was general chair for IEEE Communication Theory Workshop 2007. He will be TPC co-chair for INFOCOM 2012. He is an associate editor for IEEE Transactions on Wireless Communications and an editor for Computer Networks Journal and IEEE Wireless Communication Magazine.

**Research Interests:** Network management, network security, network information theory, and stochastic modeling and analysis.

**Honors and Distinctions:** Member of IEEE and ASEE, 2003 NSF CAREER award, 2005 ONR YIP award, IEEE INFOCOM 2009 Best Paper Award run-up, IEEE ICC 2008 best paper award.

**Selected Publications:**

- D. Zheng, W. Ge, and J. Zhang, "Distributed Opportunistic Scheduling for Ad-Hoc Communications: An Optimal Stopping Approach," presented at ACM Mobihoc, 2007.
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- S. Wang, D. Ding, X. Liu, X.-B. Zhang, D. J. Smith, J. K. Furdyna, and Y.-H. Zhang, "MBE growth of II/VI materials on GaSb substrates for photovoltaic applications," J. of Cryst. Growth, 311, 2116, 2009.
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