Organizational Structure for Ira A. Fulton Schools of Engineering

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

Message from the Director .................................................. 2

YEAR IN REVIEW

Faculty Honors and Awards
- Farmer Recognized for Outstanding Contributions ............... 4
- Heydt Wins Technical Field Award ................................. 4
- Cao Named “Exemplar” .............................................. 4
- Best Paper Award ..................................................... 5
- Best Product Award .................................................. 5
- Frakes Named ASU Centennial Professor ......................... 5
- Top 5 Percent of Instructor Ratings ............................... 5
- ECEE Research Professors ......................................... 6
- ECEE Affiliate Professors .......................................... 6
- ECEE Adjunct Faculty ............................................... 7
- ECEE Faculty Associates .......................................... 7
- Faculty Named IEEE Fellow ...................................... 7
- Rodriguez Inspires Young Minds into Engineering .......... 7
- Recent Books by Faculty ........................................... 8

Employee Service and Impact & Excellence Awards ........... 8

Student Awards
- Enrollment ............................................................. 9
- Graduate Fellowships ............................................... 9
- Doctoral Graduates ................................................ 10
- Palais Award ........................................................ 11
- Two ECEE Students Receive Fulbright Scholarships ........ 12
- Goldwater Scholarship ............................................. 12
- ASU Innovation Awards ........................................... 12
- IEEE Awards ........................................................ 12
- Undergraduate Honors and Scholarships ....................... 12

Feature Stories
- “Stacking cells” method to improve chip memory ............ 13
- MURI grant will research battlefield communications network 14
- ECEE student engineers a “micro mascot” ...................... 14
- New alloy holds promise for energy-efficient lighting ....... 15

Research Centers
- Connection One: Integrated Circuits and Systems Research Center 16
- Wireless Integrated Nanotechnology Center (WINTech) .... 17
- Power Systems Engineering Research Center (PSERC) .... 18
- Sensors, Signal and Information Processing Center (SenSIP) 19
- Arizona Initiative for Renewable Energy (AIRE) ........... 20
- Arizona Institute for Nano-Electronics (AINE) ............... 21

Faculty Listings ............................................................ 22

Calling All Alumni ......................................................... 41
Recovery and Reinvestment -

Our school has emerged from the budget stresses of the last two years stronger than ever. ASU has protected our core academic mission from budget cuts and has even made new investments through two new faculty hires this past year. This investment continues with several faculty searches in the current academic year. Of particular note are the positions in photovoltaics and in flexible electronics. These positions support key investment areas for ASU, which have led to two NSF ERC proposal site visits this year. ASU is the lead institution and ECEE faculty play significant roles in each of these ERC proposals.

Our research expenditures continue to grow at an impressive rate nearly tripling in the past five years from $9.9M in the fiscal year ending in 2005 to $28.1M in the fiscal year ending in 2010. New research awards are even higher totaling more than $32.5M and predicting continued growth in expenditures. Our program enrollments are growing with more than 550 undergraduates and more than 750 graduate students, including more than 250 Ph.D. students. The class of entering freshmen includes more than 100 students and our transfer student enrollment at all levels remains strong.

Our school name reflects the strong academic and research programs in the areas of Computer Engineering and Energy Engineering that have been led by Electrical Engineering degree program faculty for many years. We are launching new graduate degrees in Computer Engineering (pending formal university approval). These programs will be jointly administered by ECEE faculty and faculty from the Computer Science and Engineering program.
Our EE program has also been recognized through our strong showing in the recently released NRC rankings of ECE Ph.D. programs. In both the “R” and “S” rankings we have placed in the top-20 group (see table from http://graduate-school.phds.org/rankings/electrical-engineering). While the debate continues about the methodology and accuracy of these rankings, it is rewarding to see the accomplishments of our faculty, staff, and students recognized by this prestigious national organization. These and other new developments and accomplishments are detailed on our web page, www.engineering.asu.edu/ecee.

Stephen M. Phillips, Ph.D., P.E.
Professor of Electrical Engineering
Director, School of Electrical, Computer and Energy Engineering
Farmer Recognized for Outstanding Contributions

The Power and Energy Society of the Institute of Electrical and Electronics Engineers (IEEE) honored Professor Richard Farmer with the Outstanding Power Engineering Educator Award. Farmer was cited for his “outstanding contributions and leadership,” in power systems engineering education. A member of the U.S. National Academy of Engineering (NAE), Farmer is considered one of the world’s leading experts in subsynchronous resonance. Colleagues and students praised Farmer for his real-world industry experience, enriching both student knowledge and training experiences. Farmer worked with the Arizona Public Service utility company for 30 years. While at APS, he also taught power engineering part-time at ASU, where he still continues to teach and mentor.

Cao Named “Exemplar”

Professor Yu (Kevin) Cao was one of six faculty members named as an “exemplar” for 2009 by ASU President Michael Crow. Exemplars are considered “rising stars,” whose talent and hard work make them leaders among the finest teachers-scholars at ASU. Cao is one of the leading figures in the field of electronic design automation, semiconductor technology modeling and design tools behind nanoscale circuit design and implementation. His research funding, through both external sponsored projects and industry gifts, exceeds $1.8 million.

Heydt Wins Technical Field Award

Professor Gerald Heydt, ASU Regents’ Professor in ECEE, received the 2010 Richard H. Kaufmann Award from the IEEE for exceptional achievements in electric power quality, and transmission and distribution engineering. The Kaufmann Award is the IEEE Technical Field Award, which recognizes significant contributions to electrical engineering in the industrial environment through the design or application of systems technology, apparatus, devices or materials for plant power distribution, drive systems, process control, or other utilization systems. Heydt’s work focuses on electric power quality, transmission and distribution engineering, power systems modeling and computer control, and the dynamic response of electric power systems. He is an NAE member and a site director of the Power Systems Engineering Research Center (PSERC), a nationwide center headquartered at ASU.
Best Paper Award

Professor Jennifer Blain Christen won the Best Paper Award from IEEE Circuits and Systems Society for her report on computer-controlled electronic systems for human cells that can thrive outside the body without the use of an incubator. Her article in the *IEEE Transactions on Biomedical Circuits and Systems* was recognized as the best published in the journal over the past three years. The research is focused on ways to more easily transport cell samples so they can be examined directly using microscopes, electronic measuring instruments, and imaging devices—without disrupting the conditions the cells need to survive.

Best Product Award

A 2009 Editors’ Choice Best Product Award was awarded by Semiconductor International to Environmental Metrology Corporation (EMC) for a unique device called Electro-Chemical Residue Sensor (ECRS). Dr. Bert Vermeire, an ECEE associate professor research and chief technology officer at EMC, was instrumental in developing this product with researchers at EMC and the University of Arizona. The ECRS will dramatically reduce the amount of water that has long been required for the semiconductor manufacturing process. A wireless version of the ECRS sensor is being developed through a collaboration of EMC and Connection One at ASU.

Frakes Named ASU Centennial Professor

Professor David Frakes won the Centennial award during his first semester at ASU. The award is bestowed on faculty members who student leaders judge to “embody the ideals of service to students inside and outside the classroom.” Only two junior-level university faculty members are selected for the award each year. Winners are chosen through a selection process managed by the Associated Students of ASU, comprised of leaders of the university’s Undergraduate Student Government and Graduate and Professional Students Association.

Top 5 Percent of Instructor Ratings

ECEE Professors Bertan Bakkaloglu, Yu Cao, Michael Goryll, and Ronald Roedel were among 11 faculty members cited as ranking in the top 5 percent of instructors based on teaching evaluations. They were recognized for their dedication and teaching excellence. Recipients are chosen to undergo a process that includes nominations by students and performance reviews by peers overseen by the Schools’ Quality of Instruction Committee.
ECEE Research Faculty

Richard Akis, PhD, McMaster University in Hamilton, Ontario, Canada; Associate Professor Research: Quantum transport in mesoscopic semiconductor devices, 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, and memory devices and circuits.

Bert Vermeire, PhD, University of Arizona; Associate 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 Faculty

Affiliate Professors provide additional support to ECEE. They are from other academic units, and their duties are primarily in research, advising, and student mentoring.

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

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

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

Jiping He, 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.

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

Darryl Morrell, PhD, Brigham Young University: Engineering pedagogy, engineering applications of probability theory, particularly decision theory.

Jitendran Muthuswamy, PhD, Rensselaer Polytechnic Institute: Microelectromechanical systems (MEMS) for neural communication.

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

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

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

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

Guoliang Xue, PhD, University of Minnesota: QoS routing, resource allocation in wireless networks, security and survivability in sensor networks.
Faculty Named
IEEE Fellow

Professor **Gennady Gildenblat** was honored with the title of IEEE Fellow in 2009 for his contributions to the modeling of metal-oxide semiconductor field effect transistors. Gildenblat joined ASU in 2006 from Penn State University. He worked in GE’s Corporate Research and Development Center in Schenectady, NY, for several years, where he was engaged in semiconductor device physics and IC technology development. His area of expertise is semiconductor device physics and modeling, novel semiconductor devices and semiconductor transport, and integrated circuit technology. He has over 140 publications including several books, invited articles, and U.S. patents.

ECEE Adjunct Faculty

These are faculty from industry and other institutions, who support ECEE research and teaching.

**Alan Chin**, Founder and CEO, nLiten Energy Corporation

**Josef P. Debbins**, Staff Scientist, St. Joseph’s Hospital & Medical Center

**T. Russell Hsing**, Exec. Director, Emerging Technologies & Services Research Dept., Telcordia Technologies

**Frank M. Jahnke**, President, Sonata Biosciences, Inc.

**Elias Kyriakides**, Asst. Prof., Dept. of Electrical & Computer Engr., University of Cyprus

**Chaker Larabi**, Assoc. Prof., Univ. of Poitiers, France

**Michael McGarry**, Asst. Prof., Dept. of Electrical & Computer Engr., University of Akron

**James Pipe**, Director for Neuroimaging Research, Barrow Neurological Institute, Phoenix, Arizona

**Shalini Prasad**, Assoc. Prof., Electrical Engr. and Computer Science, Wichita State University

**Katerina Raleva**, Assoc. Prof., Dept. of Electronics, Univ. Ss. Cyril & Methodius, Skopje, Macedonia

**John Wood**, Sr. Research & Development Electronic Engineer, Freescale Semiconductor

ECEE Faculty Associates

These are faculty from industry, who support ECEE research and teaching.

**Ahmed Helmy**, Staff Analog Design Engineer, Intel Corp.

**MD Murshidul Islam**, Design Engineer, Intel Corp.

**Bassam Matar**, Prof. of Engineering Science & Technology, Glendale Community College

**Radu Secareanu**, Research Staff, Advanced Circuits Research Group, Motorola

**Hongjiang Song**, Sr. Staff Design Engineer, Intel Corp.

**Nital S. Patel**, Pathfinding Group Leader, Intel Corp.

**Glen Abousleman**, Electrical Engineer, General Dynamics

Rodriguez Inspires Young Minds into Engineering

*Engineering: Go For It* magazine, published by the American Society for Engineering Education, featured ECEE Professor **Armando Rodriguez** in its “Class Acts” section. Rodriguez is lauded for his work in recruiting and mentoring young students in science, engineering, math, and technology fields. He leads a National Science Foundation-funded program that provides scholarships to students pursuing education in those areas.
ECEE Employee Service and Impact & Excellence Awards

The following ECEE faculty and staff were recognized for their service and professional excellence during the annual Engineering awards luncheon, held April 15, 2010:

**Service Award**
- **45 Years** – Joseph Palais
- **25 Years** – Michael Kozicki
- **20 Years** – James Aberle, Karen Andersen, Douglas Cochran, Keith Holbert, Brian Skromme
- **10 Years** – Yu Hui, Ying-Cheng Lai, Antonia Papandreou-Suppappola
- **5 Years** – Abbas Abbassour-Tamijani, Kevin Anderson, Bertan Bakkaloglu, Hugh Barnaby, Yu Cao, Lawrence Clark, Bert Vermiere, Vijay Vittal, Brian Wagner

**Impact Award Nominees**
- Cheryl McAfee, Cheryl Ream, Clayton Javurek, Darleen Mandt, Emily Fassett, Esther Korner, Farah Kiae, James Laux, Jared Broderick, Lori Brichetto, Mia Kroeger, Nancy Osgood, Sabrina Beck, Theo Eckhardt

**Excellence Nominees**
- Cynthia Moayedpardazi, Stacy Esposito

**Team Nominations**
- **Excellent Research Advancement Team:** Lorii Brichetto, Theo Eckhardt, Stacy Esposito
- **Excellent Payroll Specialists:** Donna Rosenlof, Farah Kiae, Phouney Lopez
- **Helpful to Graduate Students and Their Success:** Darleen Mandt, Farah Kiae, Rebecca Davis
- **Strong Dedication to the Success of Engineering Faculty:** Lori Brichetto, Stacy Esposito, Nancy Osgood

**Sun Awards**
- Delilah Alirez, Stacy Esposito, Emily Fassett, Phouney Lopez, Cheryl McAfee, Deirdre Meldrum, Cheryl Ream, Donna Rosenlof, Brian Wagner
student honors & awards

Graduate Fellowships

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

Dean's Award: **William Detlaff, Edgar Marti-Arbona**

Ford Graduate Engineering Fellowship: **Timothy Day, Kyle Foley**

Fulton Fellow: **William Detlaff**

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

NASA Training Grant, GSRP: **Helen Schwerdt**

NSF Graduate Research Fellowship: **Michael DiNezza**

Palais Outstanding Student Doctoral Award: **Qingfei Chen**

Peter E. Crouch Excellence Fund: **Robert Santucci**

Raytheon: **Vicente Molieri**

Science Foundation Arizona (SFAz): **Derek Caselli, Michael DiNezza, Stephen Herman, Berkay Kanberoglu, Mojtaba Rahmati, Emre Yunus**

University Graduate Fellowship (UGF): **Adam Bailey, Paul Hale, Chenhui Niu, James Wilson**

ECEE Enrollment Information
(Fall Semester Enrollments)

Undergraduate

<table>
<thead>
<tr>
<th>Year</th>
<th>Undergraduate</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>651</td>
</tr>
<tr>
<td>2006</td>
<td>560</td>
</tr>
<tr>
<td>2007</td>
<td>523</td>
</tr>
<tr>
<td>2008</td>
<td>517</td>
</tr>
<tr>
<td>2009</td>
<td>516</td>
</tr>
</tbody>
</table>

Master's

<table>
<thead>
<tr>
<th>Year</th>
<th>Master's</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>306</td>
</tr>
<tr>
<td>2006</td>
<td>353</td>
</tr>
<tr>
<td>2007</td>
<td>556</td>
</tr>
<tr>
<td>2008</td>
<td>555</td>
</tr>
<tr>
<td>2009</td>
<td>454</td>
</tr>
</tbody>
</table>

PhD

<table>
<thead>
<tr>
<th>Year</th>
<th>PhD</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>246</td>
</tr>
<tr>
<td>2006</td>
<td>227</td>
</tr>
<tr>
<td>2007</td>
<td>231</td>
</tr>
<tr>
<td>2008</td>
<td>227</td>
</tr>
<tr>
<td>2009</td>
<td>256</td>
</tr>
<tr>
<td>Summer 2009</td>
<td>Fall 2009</td>
</tr>
<tr>
<td>-------------</td>
<td>-----------</td>
</tr>
</tbody>
</table>
Spring 2010 (cont.)

Kyle Foley, “Surface Plasmon Resonance Imaging of Surface Impedance,” Chair: N. Tao


Kailash Chandrashekar, “Power Scalable and Low Power Design Techniques for Pipeline ADCs,” Chair: B. Bakkaloglu.


---

**Palais Award**

Dr. Qingfei Chen is the recipient of the 2009-2010 Palais Award. This is the 8th year of the award. Chen’s mentor is professor Ying-Cheng Lai. Qingfei was the best of 36 electrical engineering graduating doctoral students. Chen earned a perfect 4.0 GPA and produced an outstanding publication record of 17 journal papers, all published in first rate refereed publications such as Applied Physics Letters, Physical Review, and Chaos.

Professor Joseph Palais, graduate program chair, and his wife Sandra, established the Palais Outstanding Doctoral Student Award. It is presented annually to the best graduating doctoral student in the electrical engineering program. Chen’s dissertation is titled, “Dynamics, control and shock mitigation in nonlinear microelectromechanical and nanoelectromechanical resonant devices.” Chen received $1,000 and a commemorative plaque.
Two ECEE Students Receive Fulbright Scholarships

Christina Clancey Rivera, a National Hispanic Scholar and a May graduate in electrical engineering, and Jeremy Wendt, a senior in ECEE, were among a record number of ASU students (21) who received Fulbright Scholarships this year. Rivera will study at the University of Alcala in Spain, where she will begin research in electrical energy generation systems known as microgrids. Wendt, a former Peace Corps volunteer, plans to go to Bangladesh to study the role of solar electrification in the country. He will work with faculty at the Independent University Bangladesh to analyze the impacts of using photovoltaic power.

Goldwater Scholarship

ECEE sophomore Edward Lee is a recipient of the prestigious Goldwater Scholarship, one of four ASU students to receive this nationwide award for undergraduates in the math, science, and engineering fields. Lee is conducting research in ASU’s Flexible Display Center on improving medical imaging for health care and radiological weapons detection. The Goldwater Scholarship provides $7,500 per student for up to two years.

ASU Innovation Awards

ECEE students were front and center in developing exciting new ideas and concepts at the inaugural ASU Innovation Challenge held this past spring semester. They won awards for transforming ideas into impact. ECEE undergraduates Robin Daugherty, Kevin O’Connor, and Alfonso Dominguez won for their project titled “Large-Area Flexible Chemical Sensors.” ECEE graduate student Shubo Liu, in collaboration with students from mechanical engineering and computer science, received an award for a project titled, “eBird Hotspot Wiki with Threat Watch.” Each team received $2,000 to develop the projects.

IEEE Awards

Vijay Sundaram was awarded the IEEE Phoenix Section Al Gross Student Scholarship for overall scholastic achievements and active involvement in professional and community organizations.

Michael DiNezza was a recipient of the IEEE Phoenix GOLD chapter award for leadership contributions.

Kyle Unger was awarded a 2010 MTT-S Undergraduate/Pre-Graduate Scholarship from the IEEE Microwave Theory and Techniques Society.

Undergraduate Honors and Scholarships

Fall 2009 Barrett Honors: 61
Fall 2009 Merit Scholars: 29
Scholarships (private/corporate): 129 recipients for a total of $156,608
Researchers in the Center for Applied Nanoionics (CANi) have developed an innovative method for significantly improving the memory capacity of electronic devices.

The research, which is led by CANi director and ECEE Professor, Dr. Michael Kozicki, demonstrates the capability for building stackable memory based on “ionic memory technology,” making it an ideal candidate for storage cells in high-density memory. Best of all, the new method uses well-known electronics materials.

Kozicki outlined the new memory device in a technical presentation he made in November at the 2009 International Electron Devices and Materials Symposium in Taiwan. He worked with Sarath C. Puthen Thermadam, an electrical engineering graduate student.

Current technology is fast reaching the physical limits of device memory, spurring research into new types of memory that can store more information into less and less physical space. One way of doing this is to stack memory cells.

The concept of stackable memory is akin to one’s ability to store boxes in a small room. You can store more boxes (each representing a memory cell) if you stack them and take advantage of the three dimensions of the room, rather than only putting each box on the floor.

Stacking memory cells has not been achieved before because the cells could not be isolated, according to Kozicki. Each memory cell has a storage element and an access device—the latter allowing you to read, write, or erase each storage cell individually.

The new approach continues to use silicon, but not single crystal silicon, which can be deposited in layers as part of the three-dimensional memory fabrication process.

Kozicki said the team is working on how to find a way to build an electrical element, called a diode, into the memory cell. The diode would isolate the cells, an idea that usually involves several additional layers and processing steps when making the circuit.

His team, however, has found an elegant way of achieving diode capability by substituting one known material for another, in this case replacing a layer of metal with doped silicon.
A Multidisciplinary University Research Initiative (MURI) grant of more than $600,000 from the U.S. Department of Defense was awarded to Professor Junshan Zhang to improve the reliability of communications networks under battlefield conditions.

"Battlefield wireless networks often operate under hostile conditions that include adverse radio frequency environments, interference, bursts of traffic and changing network topology," said Zhang, an associate professor in ECEE. There is an “urgent need to develop fundamental network science for identifying, representing and controlling information dynamics" in Department of Defense networks, he added.

Advances in this research area also promises to provide more reliability for various types of airborne and ground-based communications networks.

Zhang's work is ASU's part of the $7 million MURI award, titled “Information Dynamics as a Foundation for Network Management,” led by Princeton University, with research partners at the California Institute of Technology, Stanford University, University of California-Irvine, the University of Pennsylvania, and the University of Wisconsin-Madison.

**ECCE student engineers a “micro mascot”**

Adam Burke, an ECEE doctoral student may have found the tiniest—yet most cleverly inventive—way to show school spirit. He has created “Micro Sparky,” a microscopic etching of Sparky, the ASU Sun Devil mascot.

Micro Sparky measures at slightly less than five microns in height. That's smaller than a human red blood cell, which typically measures at six to eight microns—too small to be seen without an optical microscope.

Burke used electron beam lithography to etch the pattern into a material called indium arsenide placed on top of another material called indium aluminum antimonide. The Sparky pattern was created by drawing it onto the surface of the materials with a directed beam of electrons.

“You can control this process like the way you control your hand when you draw a picture," said Burke, whose academic adviser is electrical engineering professor David Ferry, an ASU Regents’ Professor.

Burke's accomplishments at ASU have helped him earn a position as a senior research assistant in the College of Physics at the University of New South Wales in Australia.
New alloy holds promise for energy-efficient lighting

A recent advance by electrical engineering researchers in developing nanowires could lead to more efficient photovoltaic cells for generating energy from sunlight, and to better light-emitting diodes (LEDs) that could replace less energy-efficient incandescent light bulbs.

ECEE Professor Cun-Zheng Ning and Alian Pan, an associate research professor in electrical engineering, are working to improve quaternary alloy semiconductor nanowire materials. Semiconductors are the material basis for technologies such as solar cells, high-efficiency LEDs for lighting, and for visible and infrared detectors.

A critical parameter of semiconductors is to widen their band gaps, which will determine, for example, if a given wavelength of sunlight is absorbed or left unchanged in a solar cell. To improve efficiency in solar cells, it’s necessary to increase the range of band gaps.

In recent attempts to grow semiconductor nanowires with “almost” arbitrary band gaps, the research team led by Ning and Pan, used a new approach to produce an extremely wide range of band gaps. They alloyed two semiconductors, zinc sulfide (ZnS) and cadmium selenide (CdSe) to produce the quaternary semiconductor alloy ZnCdSSe, which produced continuously varying compositions of elements on a single substrate.

With the new materials, Ning said he hopes to build a monolithic lateral super-cell that contains multiple sub-cells in parallel, each optimized for a given wavelength band. The multiple sub-cells can absorb the entire solar spectrum.

Such solar cells will be able to achieve extremely high efficiency with low fabrication cost. The team is working on both the design and fabrication of such solar cells.
Connection One is a National Science Foundation Industry/University Cooperative Research Center (I/UCRC) 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 conducts 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.

**Highlights, 2009-2010:**

- EE professors and Connection One/WINTech faculty, Sayfe Kiaei and Bahar Jalali-Farahani, in collaboration with Ohio State University faculty, John Volakis, received an NSF award titled “Parallel Co-Simulation & Co-Design Methodology for Electronic System-in-Package.” This project is focused on a seamless co-design integration platform for circuit, EMC/EMI, and PCB tools through a robust and systematic domain decomposition framework.

- Professor Sulev Ozev won a best paper award at a prestigious IEEE conference, the European Test Symposium, 2009, for her paper titled, “Defect Filter for Alternate RF Test.” The work involved collaboration with researchers at Intel Corp. and TIMA, France.

- Professors Kiaei, Ozev, and Bakkaloglu won an NSF grant titled, “GOALI: Autonomous Self-Healing Sensor Network Radio and Mixed-Signal Readout System Design.” The project will investigate the effect of in-field wear out on sensor network hardware and invent ways to mitigate the degradation.

For a list of projects and areas of research, visit the Connection One website at www.connectionone.com

*Photos by Jean Dixon.*
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 I/UCRC.

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.

For more information, visit http://wintech.asu.edu
Director: Vijay Vittal  
Site Director: 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’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
- Systems research to increase use, efficiency and reliability of increasingly complex and dynamic power systems

Highlights for 2009-2010:

- The Department of Energy (DoE) awarded a cooperative agreement on January 16, 2009, to the Arizona State University (ASU) Board of Regents to operate the Power Systems Engineering Research Center (PSERC). The cooperative agreement is for five years at a total value of $18,750,000, with the DoE providing $15 million and the universities providing $3,750,000 (cost share). PSERC research is leveraged by its association with industry members and its affiliation with the non-profit Consortium for Electric Reliability Technology Solutions, comprised of four national laboratories (Lawrence Berkeley, Oak Ridge, Pacific Northwest, and Sandia), an industry partner (the Electric Power Group), and PSERC.

Additional information on PSERC is available at http://www.pserc.org
Director: Andreas Spanias

The Sensor, Signal and Information Processing Center (SenSIP), directed by Professor Andreas Spanias, is an NSF-Industry/University Cooperative Research Center (I/UCRC) focused on state-of-the-art research in integrated sensing and processing and wireless sensor networks. SenSIP integrates multidisciplinary research in biosensing, communications, networks, signal and information processing, energy and defense applications, non linear dynamics, and controls. Its objective is to develop a research and education partnership with local and national companies. SenSIP’s collaborators include the School of Arts, Media and Engineering (AME) and ASU’s Biodesign Institute. SenSIP is an ABOR (Arizona Board of Regents) center.

More than 20 ASU engineering faculty members – primarily electrical and computer engineers – form the core group of SenSIP researchers. To date SenSIP’s members include leading companies in the high-tech, defense, aerospace and communications industries, such as Intel, Lockheed Martin, National Instruments, Raytheon Missile Systems, LG Communications and Acoustic Technologies.

Highlights, 2009-2010:

- SenSIP became an NSF I/UCRC site and will receive $360,000 over the next five years with $750,000 in industry matching. This will involve a partnership with the Texas Net-Centric I/UCRC consortium in Texas.
- SenSIP signed on a new industry partner in LG Communications.
- SenSIP received several industry grants, including a grant to research application of signal processing for analyzing and testing photovoltaic array performance; a grant for algorithm and software development won by Professors Iasemidis and Tsakalis; and an Intel industry contract won by Professor Lina Karam.
- Several federal grants were also awarded: Professor Lai and collaborators will research chaotic scattering and the design of complex networks; Professor Martin Reisslein is leading an NSF grant involving outreach to high schools; Professor Chaitali Chakrabarti continues her research with a large NSF-CSR grant on reclaiming Moore’s Law through ultra energy-efficient computing. Professors Junshan Zhang, Tolga Duman, and Antonia Papandreou-Suppappola are involved in four AFOSR-MURI sites in the areas of signal processing, communications, sensors, and information networks.
- The SenSIP educational software J-DSP is part of four NSF education and research projects. The software is being tested in at least 20 universities including MIT, Johns Hopkins University, ASU, Georgia Tech, and Rose Hulman Institute of Technology.

Areas of Concentration:

- Waveform-Agile and Adaptive Sensing
- Biomedical Processing and Biosensing
- Real-time Digital Signal Processing (DSP)
- Algorithm and Software Development for DSP Chips and FPGAs
- Data Mining and Genomic Signal Processing
- Signal and Information Processing for Energy Systems
- Speech, Audio, and Multimedia Signal Processing
- Image and Video Processing and Coding
- Multimedia Networks and Video
- Information Theory and Information Networks
- Wireless Communications, Channel Coding and Encryption
- Sensor Networks and Bodynets
- Signal Processing for Arts and Media
- Java-DSP (J-DSP) for Signal Analysis, Communications, and Controls
- Low-power Signal Processing and Architectures
- MRI Signal and Image Processing
- Adaptive Controls and Neural Networks for Brain Dynamics
- Nonlinear dynamics and chaos, quantum transport, and biological physics

More information can be obtained at http://sensip.asu.edu/. SenSIP News is also on Facebook and Twitter: http://twitter.com/asusensip
Director: Stephen Goodnick

The Arizona Initiative for Renewable Energy (AIRE) is part of ASU's LightWorks initiative, whose focus is to pull light-inspired research at ASU under one strategic framework. Under this initiative, AIRE's goal is to research and develop reliable, affordable, and renewable energy sources and storage suitable for commercialization in the Southwest United States.

LightWorks encompasses key energy issues in bioenergy, photovoltaics, solar thermal, fuel cell/energy storage, and energy system testing. It creates prototypes and systems analysis for renewable energy sources and develops curricula and training both on the technology of renewable energy, as well as its social, economic and policy advancement implications. LightWorks/AIRE's core renewable energy efforts include:

- ASU's Solar Power Laboratory is headed by ECEE Professor 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.
- ASU's Center for Bioenergy and Photosynthesis pursues transdisciplinary research in the use of biological and artificial systems based on biological principles.
- The Center for Renewable Energy Electrochemistry (CREE), a leader in renewable electrochemically based energy storage and conversion research for improved electrochemical performance through alternative electrolytes, 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 Consortium for Science Policy Outcomes, and Arizona Technology Enterprise, to name a few.

Highlights, 2009-2010:

- ASU entered into a strategic three-year partnership agreement with the University of Tokyo, Japan. The two universities will collaborate on research projects, exchange educational information and materials, conduct joint lectures and symposia, and exchange services of faculty members, research staff, and students. Joint efforts will include the study of high-efficiency, multi-junction solar cells, using compound semiconductor materials to optimize the absorption of the full solar spectrum, led by ECEE Professor Yong-Hang Zhang and photon research for improved efficiency in collaboration with ECEE Professor Christiana Honsberg.
- The Center for Bioenergy and Photosynthesis received a $14.02 million grant from the Department of Energy's Energy Frontier Research Center to research bioinspired solar fuel production.
- ASU has now over five awards from DoE's Solar America Initiative, one of the highest in the nation.
- ASU received two ARPA-e awards in 2009 for $10 million (biofuels and storage).

Visit the AIRE website for more information: http://aire.asu.edu/
The Arizona Initiative for Nano-Electronics (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

**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. (See story in Features section.) 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

**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

**Center for Photonics Innovation**

**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

Additional information about AINE and its constituent research centers can be found at: http://www.asu.edu/aine/
James T. Aberle
E-mail: aberle@asu.edu
Phone: (480) 965-8588
Office: GWC 326
Associate Professor, PhD, University of Massachusetts

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, MD (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:

David R. Allee
E-mail: allee@asu.edu
Phone: (480) 965-6470
Office: GWC 234
Professor, PhD, Stanford University

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 SiO2, 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 85 archival scientific publications.

Research Interests: Ultra-small device fabrication, mixed-signal circuit design for analog-to-digital conversion, and telemetry

Selected Publications:

Raja Ayyanar
E-mail: rayyanar@asu.edu
Phone: (480) 727-7307
Office: ERC 587
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 70 journal and conference papers in the area of power electronics and renewable energy integration 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, and motor drives.

Selected Publications:
R. Ayyanar and N. Mohan, “Zero Voltage Switching DC-DC Converter,” U.S. patents 6,611,444 and 6,310,785.
ELECTRICAL, COMPUTER AND ENERGY ENGINEERING  |

Bertan Bakkaloglu
E-mail: bertan.bakkaloglu@asu.edu
Phone: (480) 727-0293
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, IEEE Circuits and Systems for Medical and Environmental Applications Workshop 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, integrated power management circuits for high reliability applications, biomedical and chemical instrumentation ICs.

Selected Publications:

Constantine A. Balanis
E-mail: balanis@asu.edu
Phone: (480) 965-3909
Office: GWC 452
Regents’ Professor, PhD, The Ohio State University

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, 229 conference papers, 12 book chapters, 8 magazine/newsletter papers, and numerous scientific reports. He has also published three books: Antenna Theory: Analysis and Design, Advanced Engineering Electromagnetics, and 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), flexible antennas using FDC plastic, smart/adaptive antennas for wireless communications.

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 Awards; IEEE Phoenix Section Special Professionalism Award.

Selected Publications:

Hugh Barnaby
E-mail: hbarnaby@asu.edu
Phone: (480) 727-0289
Office: GWC 316
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:
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 techniques for nanoscale technologies, design solutions for variability and reliability, and reliable integration of post-silicon technologies.

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 Overseas 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:

Yu (Kevin) Cao
E-mail: ycao@asu.edu
Phone: (480) 965-1472
Office: GWC 336
Associate Professor, PhD, University of California, Berkeley

Kevin Cao joined the ASU faculty in 2004. He received a PhD in electrical engineering in 2002, an MA in biophysics in 1999 from the University of California, Berkeley, and he 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: 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:

Junseok Chae
E-mail: junseok.chae@asu.edu
Phone: (480) 965-2082
Office: GWC 312
Assistant Professor, PhD, University of Michigan

Junseok Chae joined the ASU faculty in 2005. He received his MS and PhD in electrical engineering in 2000 and 2003, respectively, from the University of Michigan, Ann Arbor. 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 US patents and is a recipient of the NSF CAREER Award on a MEMS protein sensor array.

Research Interests: Microelectromechanical systems sensors/actuators, micro-EMS packaging, hybrid integration: from nano to micro, micro to macro-worlds, and bio-MEMS.

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

Selected Publications:
Rodolfo Diaz  
E-mail: rudydiaz@asu.edu  
Phone: (480) 965-4281  
Associate Professor, PhD, UCLA  
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:  

Tolga M. Duman  
E-mail: duman@asu.edu  
Phone: (480) 965-7888  
Office: GWC 411B  
Professor, PhD, Northeastern University  
Research Interests: Digital communications, wireless and mobile communications, channel coding, coded modulation, multi-user communications, information theory, and underwater acoustic communications.


Selected Publications:  

Richard Farmer  
E-mail: aargf@asu.edu  
Phone: (480) 965-4953  
Office: ERC 585  
Research Professor, MS, Arizona State University  
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; 2010 IEEE Power and Energy Society Outstanding Power Engineering Educator Award.

Selected Publications:  
David K. Ferry
E-mail: ferry@asu.edu
Phone: (480) 965-2570
Office: ERC 187
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:

David H. Frakes
E-mail: dfra kes@asu.edu
Phone: (480) 727-9284
Office: ISTB1 281F
Assistant Professor, PhD, Georgia Institute of Technology

David Frakes joined ASU in the spring of 2008. He received the BS degree in Electrical Engineering and 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: general - image and video processing, fluid dynamics, machine vision; specific - endovascular treatment of congenital heart defects, suppression of atmospheric distortion in video, and control of flexible systems.

Honors and Distinctions: Mimics Innovation Award (2010); Phase I SBIR Award (2010); Arizona State University Centennial Professor of the Year Award (2009); Georgia Institute of Technology Council of Outstanding Young Alumni (2007).

Selected Publications:

Gennady Gildenblat
E-mail: gildenblat@asu.edu
Phone: (480) 965-3749
Office: GWC 302 B
Motorola Professor, PhD, Rensselaer Polytechnic Institute

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 when he joined Arizona State University. He has developed advanced surface-potential-based SP and PSP compact MOSFET models. The PSP model (joint development with Philips) was 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.

Honors and Distinctions: Fellow of IEEE; recipient of the 2006 Semiconductor Research Corporation Technical Excellence Award.

Selected Publications:
Stephen Goodnick is presently Director of the Arizona Initiative for Renewable Energy within the ASU Lightworks. 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. 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 Ninth IEEE Conference on Nanotechnology. Dr. Goodnick has published over 195 refereed journal articles, books and book chapters.

Selected Publications:

Ravi Gorur
E-mail: ravi.gorur@asu.edu
Phone: (480) 965-4894
Office: ERC 515
Professor, PhD, University of Windsor, Canada

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 and dielectrics for aircraft and communications systems. He teaches a short course on the subject of insulators that is offered to the industry annually.

Selected Publications:

Michael Goryll
E-mail: michael.goryll@asu.edu
Phone: (480) 965-9517
Office: ERC 109
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 Julich, Germany (2001-2005); Post-Graduate Scholarship granted by the RWTH Aachen University, Germany (1997-2000).

Selected Publications:
Gerald T. Heydt
E-mail: heydt@asu.edu
Phone: (480) 965-8307
Office: ERC 507
Regents' Professor, PhD, Purdue University

Gerald Thomas Heydt is from Las Vegas, NV. He holds a BSEE 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, 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 Award, 1989; IEEE Senior Member; Outstanding Faculty Award, IEEE Phoenix Section, 2007.

Selected Publications:

Keith Holbert
E-mail: holbert@asu.edu
Phone: (480) 965-8594
Office: ERC 581
Associate Professor, PhD, University of Tennessee

Keith Holbert joined the faculty in 1989. He is a registered professional engineer and has published over 100 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:

Christiana Honsberg
E-mail: christiana.honsberg@asu.edu
Phone: (480) 965-2831
Office: ERC 157
Professor, PhD, University of Delaware

Professor Christiana Honsberg joined the electrical engineering faculty in 2008. She received her BS, MS, and PhD 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 U.S., Japan, and Europe; three patents are pending.

Research Interests: Ultra-high efficiency solar cells, and silicon solar cells

Selected Publications:
Joseph Hui
E-mail: jhui@asu.edu
Phone: (480) 965-5188
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, Columbia University, and the Chinese University of Hong Kong before joining ASU. He founded and holds presidency for Nuon Labs and its subsidiaries, Pcion, Virtuon, and Etherion.

Research Interests: Wireless networks, broadband switching and routing, teletraffic analysis, coding and information theory, virtualization and cloud computing, renewable energy.

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:

Bahar Jalali-Farahani
E-mail: bahar.jalali@asu.edu
Phone: (480) 727-7191
Office: GWC 340
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:

George G. Karady
E-mail: karady@asu.edu
Phone: (480) 965-6569
Office: ERC 589
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 the electrical task supervisor for the Tokomak Fusion Test reactor project in Princeton. He has 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.


Selected Publications:
Lina Karam
E-mail: karam@asu.edu
Phone: (480) 965-3894
Office: GWC 430
Professor, PhD, Georgia Institute of Technology

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 a full 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. Prof. Karam is the recipient of a National Science Foundation CAREER Award and a NASA Technical Innovation Award. She served as the technical program chair of the 2009 IEEE International Conference on Image Processing. She also served as the lead guest editor for the special issue on “Visual Quality Assessment” of the IEEE Journal on Selected Topics in Signal Processing. She is currently General Chair (together with Ron Schafer) of the 2011 IEEE DSP/SPE workshops. Dr. Karam serves on the editorial boards of several journals and as an elected member of several IEEE Technical Committees.

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

Honors and Distinctions: Society of Women Engineers Outstanding Graduate Student Award (1994); U.S. National Science Foundation CAREER Award (1998); Professional Leadership & Service Recognition from the IEEE Signal Processing and the IEEE Communications societies (1999); Associate Editor Service Recognition, March 2002; Senior Member, IEEE, January 2003; Outstanding Technical Contributions Award, Digital Signal Processing, IEEE Phoenix Section, Jan. 2005; ASU Last Lecture Series Nomination, 2005; NASA Technical Innovation Award, 2006.

Selected Publications:


Sayfe Kiaei
Email: sayfe@asu.edu
Phone: (480) 965-7055
Office: B 610
Associate Dean for Research, Professor, Motorola Chair in Analog and RF Integrated Circuits, PhD, Washington State University

Dr. Kiaei joined the faculty at Arizona State University in January 2001. From 1993 to 2001, he was a senior member of the technical staff with the Motorola Schafer Research Labs and Broadband Operations at Motorola. Kiaei is an IEEE Fellow and a member of IEEE’s Circuits and Systems Society, Solid State Circuits Society, and Communication Society.

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

Honors and Distinctions: IEEE Fellow; IEEE Microwave Techniques and Society (MTT) Fellow; Carter Best Teacher Award; IEEE Darlington Award; Global Standards Award (ITU Standards); IEEE Circuits and Systems Society Best Paper Award; Motorola 10X Design Award; IEEE Fellow Selection Committee Chair; IEEE Fellow Committee Award; Associate Dean for Research at ASU’s Ira A. Fulton Schools of Engineering; Director of the Connection One Center (NSF I/UCRC Center).

Selected Publications:

Michael N. Kozicki
E-mail: michael.kozicki@asu.edu
Phone: (480) 965-2572
Office: ERC 107
Professor, PhD, University of Edinburgh
Director, Center for Applied Nanoionics

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. 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 Schools 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. Kozicki is a 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 interconnects, and nano-electromechanical systems (NEMS).

Honors and Distinctions: Founder, Axon Technologies Corporation; Visiting Professor, College of Science and Engineering, University of Edinburgh; Adjunct Professor, GIIST, Korea; Founding Member, Globalbscot 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:
Research Interests: Nonlinear dynamics, quantum transport in nanostructures, complex networks, signal processing, and biological physics.

Honors and Distinctions: Outstanding Referee Award, American Physical Society, 2008; NSF ITR Award, 2003; 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 at College Park, 1992; Ralph D. Myers Award for Outstanding Academic Achievement, University of Maryland at College Park, 1988.

Selected Publications:

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 over 300 papers, including about 275 published in refereed journals. In the past five years, he has given about 50 invited seminars and colloquia worldwide.

Deirdre R. Meldrum
E-mail: deirdre.meldrum@asu.edu
Phone: (480) 965-9235
Office: SY 652
Dean, Ira A. Fulton Schools of Engineering, Professor of Electrical Engineering, PhD, 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 Genomem 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 (August 2001 – July 2011). She is Editor for the IEEE Transactions on Automation Science & Engineering. She was General Chair for the IEEE Conference on Automation Science & Engineering in 2007, and General Chair of the IEEE BioRobotics Conference in 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 IEEE, 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:

Biodesign Web site: http://www.biodesign.asu.edu/people/deirdre-meldrum

Cun-Zheng Ning
E-mail: cning@asu.edu
Phone: (480) 965-7421
Office: GWC 614
Professor, PhD, University of Stuttgart

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 100 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.


Selected Publications:
Sule Ozev
E-mail: sule.ozev@asu.edu
Phone: (480) 660-5273
Office: GWC 312
Associate Professor, PhD, University of California, San Diego

Sule Ozev received her BS degree in electrical engineering from Bogazici University, Turkey, and her MS and PhD 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 is an associate editor for IEEE Transactions on VLSI systems and serves on various program committees, including IEEE VLSI Test Symposium (2008-2010), IEEE/ACM Design Automation Conference (2007-2009), IEEE Test Conference (2007-2010), IEEE International Conference on Computer Design (2004-2010), and IEEE European Test Symposium (2006-2010). She was the general chair for IEEE International Mixed-Signals, Sensors, and Systems, 2009. In 2006, Ozev received the NSF CAREER award. She has published over 70 conference and journal papers and holds one U.S. 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, 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 TTTT Naveena Nagi Award, 2002; IBM Corporation Co-operative Fellowship Award, 2000-2002; UCSD Flavio Cristian Research Award, 1999-2001.

Selected Publications:

Joseph Palais
E-mail: joseph.palais@asu.edu
Phone: (480) 965-3757
Office: GWC 222
Professor, PhD, University of Michigan

Joseph Palais joined the faculty in 1964 and is the Electrical Engineering Graduate Program Chair. He is also Academic Director, Online and Professional Programs for Global Outreach and Extended Education of the Ira A. Fulton Schools 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 Educational Activities Board Meritorious Achievement Award; IEEE Phoenix Achievement Award; University Continuing Education Association Conferences and Professional Programs Faculty Service Award.

Selected Publications:

George Pan
E-mail: george.pan@asu.edu
Phone: (480) 965-1732
Office: GWC 318
Professor, PhD, University of Kansas

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 the 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:
Antonia Papandreou-Suppappola
Email: papandreou@asu.edu
Phone: (480) 965-7881
Office: GWC 420
Professor, PhD, University of Rhode Island

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 was recently elected to the position of Member-at-Large of the IEEE Signal Processing Society Board of Governors (2010-2012), and she is currently the Technical Area Chair for Array Processing and Statistical Signal Processing of the 2010 Asilomar Conference on Signals, Systems, and Computers. She has served as the Guest Editor for the special issue on Waveform-Agile Sensing and Processing for the IEEE Signal Processing Magazine (January 2009); Special Sessions Chair of the 2010 IEEE International Conference of Acoustics, Speech and Signal Processing; General Chair of the 2008 Sensor Signal and Information Processing Workshop; Associate Editor for the IEEE Transactions on Signal Processing (2005-2009); Technical Committee Member of the IEEE Signal Processing Society on Signal Processing Theory and Methods (2003-2008); and Treasurer of the IEEE Signal Processing Society Conference Board (2004-2006).

Research Interests: Waveform-agile sensing, time-frequency processing, stochastic signal processing, biosensing.

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

Selected Publications:

Stephen M. Phillips
E-mail: stephen.phillips@asu.edu
Phone: (480) 965-6410
Office: GWC 206
Professor and Director, PhD, Stanford University.

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. 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 and school director in 2009. He has held visiting positions at the NASA 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), microactuators, 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:

Gang Qian
E-mail: gang.qian@asu.edu
Phone: (480) 965-3704
Office: GWC 454 / Matthews Center, 240B
Assistant Professor, PhD, University of Maryland

Dr. Qian holds a joint appointment with the School of Electrical, Computer and Energy Engineering and the School of Arts, Media and Engineering. Prior to joining ASU, he was a faculty research assistant and then a research associate at the Center for Automation Research at the University of Maryland Institute for Advanced Computer Studies. Qian has published over 60 refereed journal articles and conference papers. He is a member of the IEEE.

Research Interests: Computer vision and pattern analysis, sensor fusion and information integration, multimodal sensing and analysis of human movement and activities, human-computer interaction, human-centered interactive systems, machine learning for computer vision

Honors and Distinctions: University Guo-Mo-Ruo Gold Medal, University of Science and Technology of China, 1994; Educational Institution Award for Outstanding Research Faculty, IEEE Phoenix Section 2005.

Selected Publications:
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 85 journal articles. He has over 2750 citations and an h-index of 23 based on Google Scholar data. He serves as Associate Editor for the IEEE/ACM Transactions on Networking and the Computer Networks Journal.

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; Inform 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:

Armando A. Rodriguez
E-mail: aar@asu.edu
Phone: (480) 965-3712
Office: GWC 352
Professor, PhD, Massachusetts Institute of Technology

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:

Ronald Roedel
E-mail: r.roedel@asu.edu
Phone: (480) 965-9261
Office: ECG 102
Professor, PhD, UCLA

Ronald Roedel joined the faculty in 1981 and was associate dean of the Ira A. Fulton Schools 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 over 30 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:

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:

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:

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:
Research Interests: Simulation of membrane proteins. Semiconductor devices, and the development for 2-D and 3-D simulation of semiconductor Monte Carlo and cellular automaton techniques. Biological structures. His recent scientific work 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 automation 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:
Brian Skromme
E-mail: skromme@asu.edu
Phone: (480) 965-8592
Office: ERC 155
Professor, PhD, University of Illinois

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 Marquis’s Who’s Who in America.

Selected Publications:

Andreas Spanias
E-mail: spanias@asu.edu
Phone: (480) 985-1837
Office: GWC 440
Professor, PhD, West Virginia University

Andreas Spanias joined the ASU faculty in 1988. He has published more than 57 journal and 170 conference papers and contributed several book chapters. He authored two textbooks in DSP and Audio Coding and two monographs in the Morgan-Claypool Lecture Series. He has served as associate editor of IEEE Transactions on Signal Processing, as the general co-chair of the IEEE ICASSP-99 and as vice-president of the IEEE Signal Processing Society (SPS). He received the 2005 IEEE SPS Meritorious Service Award. He is currently associate director of the ASU School of Arts, Media and Engineering (AME), director of the Sensors, Signal and Information Processing (SenSIP) center, an NSF I/UCRC, PI of a major multi-university NSF program, and Co-PI of the NSF AME IGERT program. He is a series editor for Morgan-Claypool books.

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, 2004; Donald G. Fink Prize for paper titled “Perceptual Coding of Digital Audio,” 2002; Intel Advanced Personal Communications Award, 1997; Intel Research Council: NDTC Award, 1996; Intel 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:

Nongjian (NJ) Tao
Email: njtao@asu.edu
Phone: (480) 965-4456
Office: Biodesign B138
Director, Center for Bioelectronics and Biosensors, The Biodesign Institute
Professor, PhD, Arizona State University

NJ 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 has 10 patents, and has published over 180 refereed journal articles and book chapters, which have been cited over 7,200 times. He has given over 180 invited and keynote talks worldwide.

Research Interest: Chemical and biological sensors, molecular and nano electronics, nanostructured materials and devices, and electrochemical nanofabrications.

Honors and Distinctions: Alexander von Humboldt Senior Research Award; Hellmuth Fischer Medal; National Science Foundation Two-Year Extension for Special Creativity; Excellence in Research Award, Florida International University; AZTE Innovator of the Year; Molecular Imaging Young Microscopist.

Selected Publications:
Cihan Tepedelenlioglu  
E-mail: cihan@asu.edu  
Phone: (480) 965-6623  
Associate Professor, PhD, University of Minnesota

Cihan Tepedelenlioglu 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, data mining for PV systems.

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

Selected Publications:  

Trevor Thornton  
E-mail: t.thornton@asu.edu  
Phone: (480) 965-3808  
Assistant Professor, PhD, Cambridge University

Trevor Thornton joined the ASU 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 splitgate 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, microelectromechanical systems (MEMS), silicon-on-insulator MESFETs.

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

Selected Publications:  

Konstantinos Tsakalis  
E-mail: tsakalis@asu.edu  
Phone: (480) 965-1467  
Office: GWC 358  
Professor, PhD, University of Southern California

Konstantinos Tsakalis joined the ASU faculty in 1988 and is currently a professor. He received an MS in chemical engineering in 1984, an MS 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:  
Daniel Tylavsky
E-mail: tylavsky@asu.edu
Phone: (480) 985-5460
Office: ERC 517
Associate Professor, PhD, Pennsylvania State University

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-IAAS Mining Engineering Committee; various awards for outstanding teaching.

Selected Publications:


Dragica Vasileska
E-mail: vasileska@asu.edu
Phone: (480) 985-6651
Office: ERC 165
Professor, PhD, Arizona State University

Dragica Vasileska joined the ASU faculty in August 1997. She has published over 150 journal articles in prestigious refereed journals, 15 book chapters, and 120 articles in conference proceedings in the areas of solid-state electronics, transport in semiconductors, and semiconductor device modeling. She is the author of three books (D. Vasileska and S. M. Goodnick, Computational Electronics, Morgan & Claypool, 2006; D. Vasileska, Editor, Cutting Edge Nanotechnology, March 2010, and D. Vasileska, S. M. Goodnick and G. Klimeck, Computational Electronics: From Semi-Classical to Quantum Transport Modeling, CRC Press, June 2010). 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 nanoscale devices, current collapse in GaN HEMTs.

Honors and Distinctions: Listed in Who’s Who 2007; NSF CAREER Award, 1998; University Cyril and Methodius, 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:


Vijay Vittal
E-mail: vijay.vittal@asu.edu
Phone: (480) 985-1879
Office: ERC 513
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. At ISU, Dr. Vittal held the Murray and Ruth Harpole Professorship, directed ISU’s Electric Power Research Center and was the site director of the NSF I/UCRC Power System Engineering Research Center (PSERC). From 1993 to 1994, he served as a program director of power systems for the NSF Division of Electrical and Communication Systems in Washington, D.C. Currently, he is the director of PSERC, a consortium of 13 universities and over 45 companies. ASU is the lead school. He is the editor-in-chief of IEEE Transactions on Power Systems. He has published 120 articles in refereed journals, 103 refereed conference proceedings 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 (ISU) College of Engineering Anston Marston Distinguished Professor, 2004; ISU Foundation Award for Outstanding Achievement in Research, 2003; IEEE Power Engineering Society Technical Council Committee of the Year Award, 2000-2001; IEEE Outstanding Power Engineering Educator Award, 2000; Warren B. Boast Undergraduate Teaching Award, 2000.

Selected Publications:

Hongbin Yu
E-mail: yuhb@asu.edu
Phone: (480) 965-4456
Office: ERC 159
Assistant Professor, PhD, University of Texas at Austin

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. He conducted post-doctoral research at California Institute of Technology and University of California at Los Angeles.

Research Interests: Nanostructure and nanodevice 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:

Hongyu Yu
E-mail: hongyuyu@asu.edu
Phone: (480) 747-7454
Office: GWC 338
Assistant Professor, PhD, University of Southern California

Hongyu Yu joined ASU in 2008 holding a joint position between School of Earth and Space Exploration and the School of Electrical, Computer and Energy Engineering. He received a BS and MS degrees in electrical 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 scientists to explore a variety of earth environments and space science, such as seismology, biogeochemistry, volcanology, and astrobiology. 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, 3-D MEMS/NEMS manufacturing, and wireless circuit component development.

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

Selected Publications:

Junshan Zhang
E-mail: junshan.zhang@asu.edu
Phone: (480) 727-7389
Office: GWC 411D
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 University 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 a general chair for IEEE Communication Theory Workshop 2007. He will be the 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 learning and analysis.

Honors and Distinctions: Member of IEEE and ASEE; 2003 NSF CAREER Award; 2005 ONR YIP Award; IEEE INFOCOM 2009 Best Paper Award runner-up; IEEE ICC 2008 Best Paper Award.

Selected Publications:
Calling All Alumni…

Do you have a career update or favorite ASU memory that you’d like to share with your electrical engineering classmates? Send your information to askee@asu.edu.

We will include your story in ECEE Connections, a semiannual newsletter developed by the department to keep in touch with alumni.

The newsletter features profiles of our graduate students, department news, and research and faculty updates.

Visit us at http://ee.fulton.asu.edu/alumni/