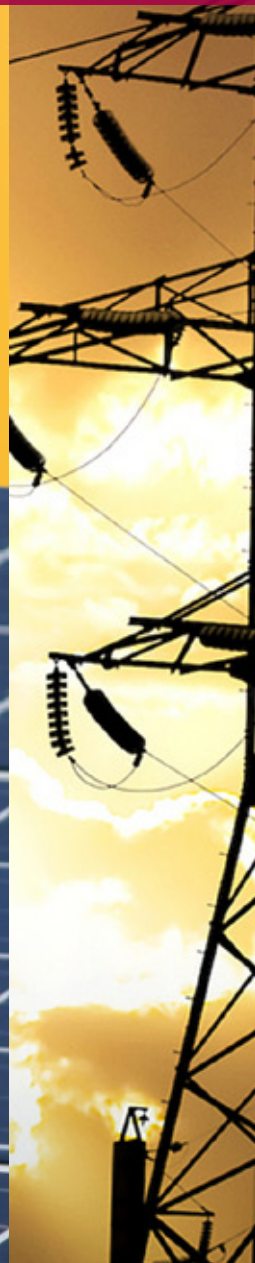
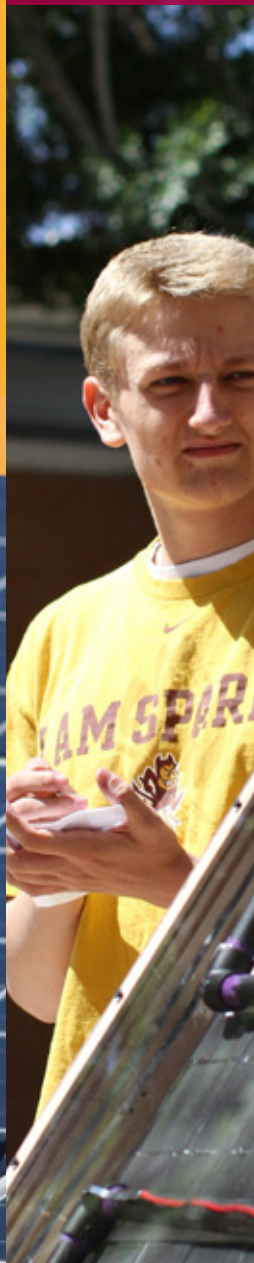


changing the way we look at

energy

**school of
electrical, computer and
energy engineering**



QESST Engineering Research
Center: Revolutionizing
energy for the world

page 12

Power Systems Energy
Research Center investigates
new energy system grid

page 16

ASU LightWorks:
Putting light to work

page 20

2010–2011 Annual Report

ASU Ira A. Fulton
Schools of Engineering

ARIZONA STATE UNIVERSITY

IRA A. FULTON SCHOOLS OF
engineering

Transcending the traditional

Focusing on the student
experience and student
success

Inspiring future engineers

Pursuing use-inspired
research

Attracting top faculty

Dean

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health systems
engineering**

**School Director
Marco Santello**

medical diagnostics
rehabilitation
neuroengineering
biomaterials and therapeutics delivery
synthetic and systems biology
healthcare technology

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informatics,
and decision
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engineering**

**School Director
Ronald G. Askin**

personalized learning
educational gaming
energy-efficient data storage and
computing
health informatics
haptic interfaces
assisting devices
health care system logistics
information assurance
production logistics
artificial intelligence
transportation
production logistics

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electrical,
computer
and energy
engineering**

**School Director
Stephen M. Phillips**

photovoltaics
power and energy systems
biosignatures discovery automation
wireless implantable devices
sensors and signal processing
flexible electronics
power grid management and stability
sensors and sensing

**school for
engineering of
matter, transport
and energy**

**School Director
Kyle Squires**

personalized learning
engineering education
K-12 STEM
electrical energy storage
thermal energy storage and
conversion
energy production separations
therapeutics and bioseparations
rehabilitation and robotics
adaptive and intelligent materials
high-performance computing
simulations
atmospheric processes

**school of
sustainable
engineering
and the built
environment**

**School Director
G. Edward Gibson, Jr.**

biofuels
waste conversion to energy
public health-technology-environment
interactions
microorganism-human health
connections
infrastructure and product lifecycle
analysis
earth systems engineering
water purification
resource-climate interactions
indoor air quality
SMART innovations
transportation materials and systems
project performance
underground infrastructure



ARIZONA STATE
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**IRA A. FULTON SCHOOLS OF
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Engineering Development

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For more information about ASU, the
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and Energy Engineering (ECEE),
please visit us online at
<http://engineering.asu.edu/ecee>

**School of Electrical,
Computer and Energy
Engineering (ECEE)
Annual Report
2010-2011**

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

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Message from the Director

We have also invested in our students, both undergraduate and graduate. This commitment has resulted in the largest graduate student enrollment in the school's history.

Investing in People -



Stephen M. Phillips

Several significant investments in people have driven recent successes in our school. Among these accomplishments is the award of a prestigious Engineering Research Center by the National Science Foundation to Professor Christiana Honsberg and her team. The Quantum Energy and Sustainable Solar Technologies (QESST) Center is co-funded by the NSF and the Department of Energy, which will jointly invest more than \$18 million over the first five years of the center. This is the

first NSF-ERC led by Arizona State University in the university's history. A significant expansion of our solar program and the recruitment of Christiana and her team helped lead us to this award. More details about this innovative center can be found in this report.

Additional investments in recruiting new faculty will continue in the coming year with our school slated to hire up to eleven new faculty positions in areas ranging from photovoltaics to power systems to circuits. This recruiting effort follows the retirement of two long-time faculty members, Ron Roedel and Joe Palais. Ron and Joe remain engaged with our programs despite receiving no compensation from the university. The hiring of new faculty will allow us to grow our research programs in several strategic areas and contribute to the university's aggressive goal of \$700 million in research by 2020. This past year, our school contributed \$28 million in research.

We have also invested in our students, both undergraduate and graduate. This commitment has resulted in the largest graduate student enrollment in the school's history (more than 900 in fall 2011) and an increase in undergraduate enrollment (more than 600 in fall 2011). We expanded the number of graduate student assistantships, scholarships, and fellowships and added key infrastructure including a new senior design projects laboratory, upgrades to computing equipment in the teaching CAD-lab, a high-performance computing facility for student use, and two dedicated freshman-level teaching and design studios called eSpace. These investments will continue this year with an electronics innovation space for student projects, collaborations, and competitions.

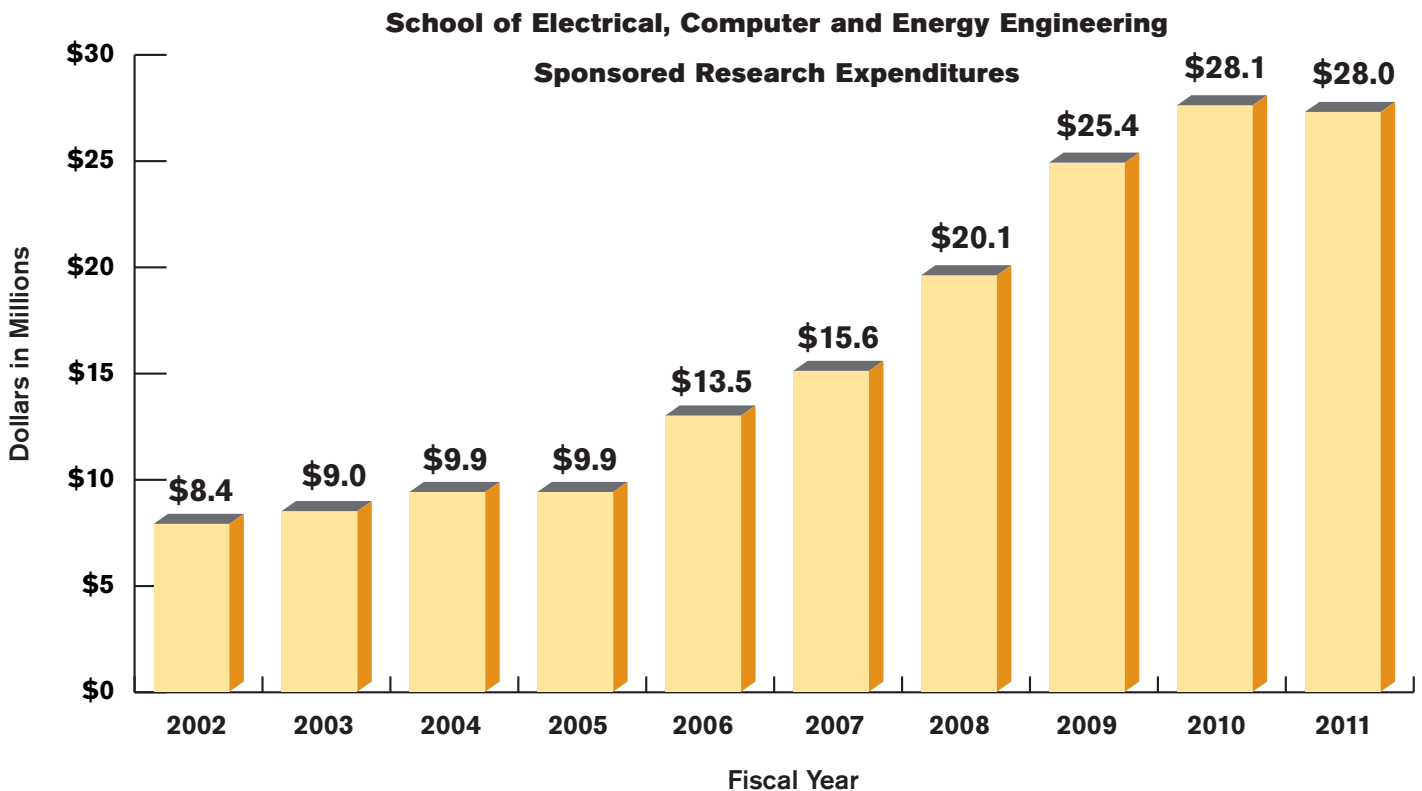
This year, in collaboration with the School of Computing, Informatics, and Decision Systems Engineering, we launched new MS and PhD programs in computer engineering. Our graduate programs remain highly recognized with our EE graduate program ranked 31 by US News and World Report and ranked in the top 20 by the National Research Council. Our faculty are highly recognized with three full-time and two part-time National Academy of Engineering members and more than 20 fellows of professional societies including IEEE, AAAS, and APS. The extraordinary efforts of our dedicated faculty, staff, and students continue to drive the success of our school.



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

Faculty Honors

NAE Members	3
IEEE Fellows	19
NSF CAREER	11
DoD/ONR – YIP	5



year in review



Professor **Tolga Duman** became Fellow of the Institute of Electrical and Electronics Engineers (IEEE). Fellows are selected based on their extraordinary record of accomplishments in any of the IEEE fields of interest. The total number selected in any one year does not exceed one-tenth of one percent of the total voting Institute membership. Duman was cited for his

“contributions to coding and modulation for wireless, recording and underwater acoustic channels.” His research focuses on digital communications, wireless and mobile communications, channel coding, turbo codes, coding for recording channels, and coding for wireless communications.



Professor **Nongjian Tao** was elected Fellow of the American Physical Society (APS) and Fellow of the American Association for the Advancement of Science (AAAS) in 2010. The APS recognized Tao's outstanding contributions to physics, and for “his pioneering and innovative contributions to the science and technology of molecular and

nanoelectronics, electrochemical based nanofabrications, and chemical sensors.” The AAAS Fellow title is earned through a peer review process and bestowed on individuals who demonstrate outstanding contributions to the field of science and engineering. Tao, who is the director of the Center for Bioelectronics and Biosensors in ASU's Biodesign Institute and is affiliated with ASU's chemistry, biochemistry, and materials engineering programs, works in the area of molecular electronics, nanostructured materials and devices, chemical and biological sensors, interfaces between biological molecules and solid materials, and electrochemical nanofabrications.



ASU Regents' Professor **Dieter K. Schroder** was named Outstanding Graduate Student Mentor by the ASU Graduate College. He was recognized for his commitment to student success and his exceptional skills for “communicating complex ideas in an understandable context.” Professor Schroder joined the ASU faculty in 1981 after 13 years at

the Westinghouse Research Labs. He has graduated 62 MS students and 41 PhD students, and has a distinguished academic career that includes two books, several book chapters, 178 journal articles, and 167 conference presentations. He also holds five patents, and he has also edited several books.



Professor **Ravi Gorur** received the 2011 Claude de Tourreil Memorial Award for Lifetime Achievement in the Field of Electrical Insulators. Established in 2009, the award honors the memory of the late Claude de Tourreil – one of the insulator industry's most respected figures. Gorur currently directs several insulation projects sponsored by industry, power utilities, and

government agencies. He has co-authored a textbook on HV insulators, published numerous papers in IEEE journals, and also participated in professional society working groups to produce standards and guides for composite insulators and RTV silicone coatings. Professor Gorur is an IEEE fellow and the undergraduate program chair for ECEE.



Professor **Lina Karam** received the 2010 Distinguished Alumnus Award from the American University of Beirut (AUB) Faculty of Engineering and Architecture. Karam was also a plenary speaker at this 10th annual event that recognized distinguished AUB alumni and outstanding student papers and posters. The event was held in AUB, Beirut, in May 2011.



Professor **Stephen Goodnick** was elected president of the board of governors of the IEEE - Eta Kappa Nu (HKN) ECE Honor Society for 2011. He was also elected president of the IEEE Nanotechnology Council for a two-year term, starting in January 2012. Goodnick is Fellow of the IEEE and an Alexander von Humboldt Research Fellow. He is the

deputy director of ASU LightWorks, a university-wide initiative promoting light-inspired and energy research.

Top 5 Percent of Teacher Ratings



Assistant Professor **David Frakes** (*left*) and Associate Professor **James Aberle** (*right*) were cited as ranking in the top 5 percent of instructors based on teaching



evaluations. The recognition process involves nominations by students, performance review by peers, and oversight by the School's Quality of Instruction Committee.

Best Paper/Poster Awards

A paper titled, "Strategies, challenges and prospects for active learning in the computer-based classroom," won Professors **Keith Holbert** and **George Karady** the 2010 Best *IEEE Transactions in Education* Paper Award, marking the first time ASU faculty members have earned this recognition for an article on education theory in this journal. The paper's topic is computer-based learning techniques and strategies for engineering.

Professor **Armando Rodriguez** and colleagues received the Ralf Yorque Memorial Prize for their paper titled, "Robustness, vulnerability, and adaptive capacity in small-scale social-ecological systems: The Pampa Irrigation System in Nepal," which appears in the 2010 issue of *Ecology and Society*. The paper's focus is the development of robust decision (control) policies for highly uncertain renewable resource systems, such as fisheries and irrigation systems. The collaboration involved Dr. Elinor Ostrom—a faculty member of Indiana University and ASU—who received the 2009 Nobel Memorial Prize in Economics.

Associate Professor **Cihan Tepedelenlioglu** and ECEE student, **Yuan Zhang**, received a best paper award for "Applications of Tauberian theorem for high-SNR analysis of performance over fading channels," presented at the Proceedings of the 12th IEEE International Workshop on Signal Processing Advances in Wireless Communications (SPAWC) 2011.



Professors **Chaitali Chakrabarti** (left) and **Antonia Papandreou-Suppappola**, with ECEE students, **L. Miao** (right) and **J. J. Zhang**, received the Bob Owens Memorial Best Paper Award at the IEEE Workshop on Signal Processing Systems (SiPS) in October 2010 for their work titled, "A new parallel implementation for particle filters and its application to adaptive waveform design."

Professor **Yong-Hang Zhang**, ECEE student, **Jing-Jing Li**, ASU post-doctoral scholars, **Swee H. Lim**, **Charles R. Allen**, and **Ding Ding**, received a best poster award at the 2011 IEEE Photovoltaic Specialists Conference (PVSC) meeting. Professor Zhang's team, which included post-docs, Swee H. Lim, Charles R. Allen, and Ding Ding, ECEE Professor **Dragica Vasilevska**, and collaborators from University of Notre Dame, also earned an IEEE PVSC best poster award nomination at this meeting.

Professor **Sule Ozev** and students, **E. Yilmaz** and **A. Nassery**, won a best student paper award at the International Test Conference for their 2009 publication, "Built-in EVM measurement for OFDM transceivers using all-digital DFT," written in collaboration with E. Acar.

Invited Speaker/ Expertise

Professor **Constantine A. Balanis** was a plenary session speaker at the 2011 European Conference on Antennas and Propagation (EuCAP 2011). The title of his talk was "Why we need to educate and train EM engineers and scientists."

Professor **Armando Rodriguez** gave a plenary talk on the topic of meeting national STEM workforce needs in engineering at the National Science Foundation MGE@MSA Southwest Regional Doctoral Mentoring Institute, held October 2010 at the University of Utah. Rodriguez also delivered an invited plenary talk at the MGE@MSA Southwest Regional Conference held at ASU, where he addressed students on the importance of graduate school.

Professor **Lina Karam** was an expert panel speaker at the IEEE ICASSP 2011 conference. She was an invited participant in a research panel at Tampere University of Technology, Finland. She is a guest editor for the IEEE Signal Processing Magazine, and a general chair for the 2011 IEEE International DSP/SPE workshops.

New Product Development

ECEE graduate students, **Jinru Liu** and **Shuang Hu**, have developed an i-JDSP education and research software tool that can be used on iPhone, iPod, and iPad platforms. i-JDSP is based on the Java-DSP concept developed by Professor **Andreas Spanias**. The research is funded in part by an NSF Phase 3 STEM grant and the SenSIP NSF I/UCRC. The i-JDSP app offers a suite of signal analysis functions on the iPhone/iPad multi-touch iOS graphical user interface. It is being tested in the digital signal processing and signals and systems classes and is being certified for free release on the Apple iTunes store. An i-JDSP research version for sensor network monitoring and control will be released in the spring of 2012.

ECEE Research Faculty

Richard Akis, PhD, McMaster University Hamilton, Ontario, Canada; Associate Research Professor: 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 Research Professor: Characterization of silicon materials for photovoltaic applications.

Sergio Clavijo, PhD, Arizona State University; Assistant Research Professor: Artificial electromagnetic materials for antenna applications.

Nikolai Faleev, PhD, All-Union Institute of Physical-Technical Measurements, Moscow district, Russia; Associate Research Professor: High resolution X-ray diffraction, III-Nitrides, Si-Ge, III-V compounds, AFM, PL, X-ray topography, structural investigation of epitaxial structures: crystalline defects at epitaxial structure, defects engineering, design optimization of device structures.

Liang Huang, PhD, Arizona State University; Assistant Research Professor: Signal processing with application in epilepsy, nonlinear dynamics, relativistic quantum chaos, electronic properties of grapheme quantum dots, and general theoretical studies of complex networked systems, random matrix theory, and critical phenomena.

Narayan Kovvali, PhD, Duke University; Assistant Research Professor: Statistical signal processing and time-frequency analysis, detection and estimation theory, stochastic filtering and tracking.

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

Derrick Lim, PhD, Arizona State University; Assistant Research Professor: Circuit model of nanostructures, electromagnetics, RF nanotechnology, MIMO antennas.

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

George Maracas, PhD, Cornell University; Research Professor: Nanostructures for solar energy conversion and transitioning renewable energy technologies and practices for building a sustainable society.

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 Research Professor: Solid-state electronics.

Wenxu Wang, PhD, University of Science and Technology, China; Assistant Research Professor: Theoretical physics.

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; Professor: Silver and copper metallization and low-k dielectrics for future integrated circuit (IC) technologies, advanced metallization for low power electronics.

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

Sandwip Dey, PhD, Alfred University; Professor: MOCVD and chemical processing science of electro-ceramics and contact metals.

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

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

Leon Jassemidis, PhD, University of Michigan, Ann Arbor; Associate Professor: Advanced digital signal processing and global optimization techniques; dynamics and control of spatiotemporal chaotic transitions in spatially coupled systems.

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

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

Sethuraman Panchanathan, PhD, University of Ottawa; University Chief Officer: Multimedia computer and communication, haptic user interfaces, assistive and rehabilitative device technologies.

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

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

Guoliang Xue, PhD, University of Minnesota; Professor: QoS routing, resource allocation in wireless networks, security and survivability in sensor networks.

ECEE Adjunct Faculty

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

Alan Chin, nLiten Energy Corp.

Larry Cooper, Ret. Office of Naval Research

Josef Debbins, Barrows Institute

Frank Jahnke, Sonata Biosciences, Inc.

Bahar Jalali, Arizona State University

Elias Kyriakides, University of Cypress

Michael McGarry, University of Texas at El Paso

Shalini Prasad, Wichita State University

Katerina Raleva, SS Cyril and Methodius University

Seth Wilk, SJT Micropower

ECEE Faculty Associates

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

Glen Abouseleman, Electrical Engineer, General Dynamics

Mohamed Arafa, Research Council Strategic Program Manager, Intel Corp.

Douglas Garrity, Analog Design Engineer, Freescale Semiconductor/Motorola

Ahmed Helmy, Staff Analog Design Engineer, Intel Corp.

MD Murshidul Islam, Design Engineer, Intel Corp.

Bassam Matar, Prof. of Engineering Science & Technology, Chandler-Gilbert Community College

Nital Patel, Pathfinding Group Leader, Intel Corp.

Radu Secareanu, Freescale Semiconductor

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

Recent Books by Faculty

I. Kyriakides, D. Morrell, and **A. Papandreou-Suppappola**. *Adaptive High-Resolution Sensor Waveform Design for Tracking*, Morgan & Claypool Publishers, 2010.

K.N. Ramamurthy and **A. Spanias**. *MATLAB Software for the Code Excited Linear Prediction Algorithm: The Federal Standard-1016*, Morgan & Claypool, Dec 2010/Jan 2011.

Y.-C. Lai and T. Tel. *Transient Chaos - Complex Dynamics on Finite-Time Scales* (500 pages), Springer, New York, 2011.

G. Goldenblat, ed., *Compact Modeling: Principles, Techniques and Applications*, Springer, 2010.

D. Vasileska, **S. M. Goodnick** and G. Klimeck, *Computational Electronics: Semiclassical and Quantum Transport Modeling*, Taylor and Francis, 2010.

D. Vasileska and **S. M. Goodnick**, eds., *Nano-Electronic Devices: Semiclassical and Quantum Transport*, Springer, 2011.

Academic Advisor Award to Levin

Lauren Levin, ECEE academic success coordinator, received the 2011 Engineering Projects in Community Service Gold Academic Advisor of the Year award presented by the Council of Academic Advisors, ASU Parents Association, the ASU Provost's Office, and the ASU Career Services Office. The award recognizes advisors whose work demonstrates effectiveness in recruiting and retaining students, and guiding them to success in their academic careers.

ASU Employee Service and Impact & Excellence Award

Kevin Anderson, ECEE academic success specialist, received an Impact Award for Excellence.

Impact Award Nominees

Achievement – Emily Fassett

Customer Service – Kevin Anderson, Farah Kiaei

Performance – Cheryl Ream, Brett Dellandre

Excellence Award Nominees

Emily Fassett, Clayton Javurek, George Karady, Arthur Handugan

ASU Service Award

25 years – Clayton Javurek, George Karady

20 Years – Arthur Handugan, Cheryl Ream, Armando Rodriguez, Chaitali Chakrabarti

15 years – Richard Akis, Loriann Brichetto, Gerald Heydt, Shane Johnson, Lina Karam, George Pan, Dragica Vasileska

10 years – Raja Ayyanar, Martin Reisslein, Junshan Zhang

5 years – Junseok Chae, Bahar Jalali-Farahani, Narayan Kowali, Carrie Sinclair, Hongbin Yu

ASU Sun Awards

Jared Broderick, Emily Fassett, Farah Kiaei, Nancy Osgood, Donna Rosenlof

Student Chapter Wins Again!

For the 4th consecutive year, the **Epsilon Beta Chapter of Eta Kappa Nu (HKN)** was selected as a recipient of the Outstanding Chapter Award by HKN National. The award is given to an organization based on the amount of chapter activities and service hours put in by members. Activities include professional development, raising instructional and institutional standards, and encouraging scholarship, creativity, and public service.



Musician/Engineer Takes in Global Perspective on Solar Energy



ECEE undergraduate **Steven Limpert** won a \$9,000 grant from the Circumnavigator Club Foundation, a national non-profit organization established in 1902 that encourages global fellowship and understanding. Limpert, who is also an accomplished trumpeter, having won many national level competitions and performed regularly in the Valley, will use the award to study the development and commercialization of solar energy technologies in six countries - Australia, Japan, Bangladesh, India, Germany and Spain. He will study

the response of solar energy businesses and research institutions to changes in government policies. Limpert began working in the summer of 2010 with Professors **Stephen Goodnick** and **Stuart Bowden** at the ASU Solar Power Lab. He continued to work in the lab through the Fulton Undergraduate Research Initiative. Limpert is also in Barrett, The Honors College, and is president of Eta Kappa Nu, the electrical and computer engineering honor society.

Undergraduate Honors and Scholarships

Fall 2010 Barrett Honors: 58

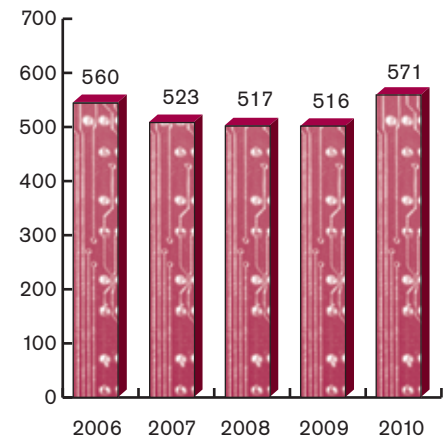
Fall 2010 Merit Scholars: 27

**Scholarships (private/corporate): 34 recipients
for a total of \$110,056**

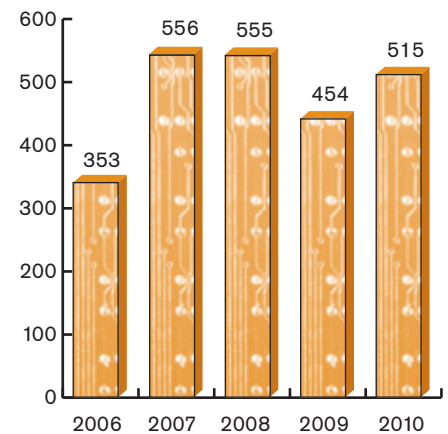
ECEE Enrollment Information

(Fall Semester Enrollments)

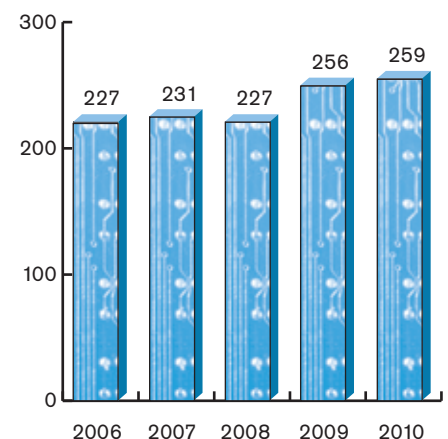
Undergraduate



Master's



PhD



Teaching Award Recognizes Excellence

Lakshminarayan Ravichandran, a recent ECEE doctoral graduate, received the Teaching Excellence Award (TEA) for 2010-2011 from ASU's Graduate and Professional Student Association (GPSA). Ravichandran was one of 20 ASU TAs to receive this award, and is currently pursuing post-doctoral research in Atlanta, GA. The TEA program, overseen by the Vice President of Internal Affairs and the Director of Graduate Research, is set up to recognize and foster excellence in graduate student teaching across all disciplines on all ASU campuses.

Fellowship Aids Research and Teaching

ECEE doctoral student, **Michael DiNezza**, was awarded two fellowships recently--one from Science Foundation Arizona (SFAz) and another from the National Science Foundation (NSF). The SFAz award involves teaching middle school students about energy, circuits, solar energy, and other alternative energy sources to meet daily needs. DiNezza received an NSF Graduate Research Fellowship to support his research in semiconductor optoelectronic devices, including high-efficiency solar cells, high-efficiency light emitting diodes (LEDs), lasers and photodetectors. DiNezza works in ECEE Professor **Yong-Hang Zhang's** optoelectronics group.



Graduate Fellowships

Achievement Rewards for College Scientists (ARCS)	Robert Santucci, Elizabeth Steenbergen, Michael DiNezza
Dean's Award	William Detlaff, Alfonso Dominguez, George Kunnen, Edgar Marti-Arbona, Jay Prigmore, Brian Proulx
Graduate College Fellowship	Xiat Qui
Fulton Fellow	George Kunnen, Brian Proulx
National GEM Fellowship	Edgar Marti-Arbona
NASA Graduate Student Researchers Program (GSRP)	Jeffrey Dickeson
NASA Training Grant: GSRP	Helen Schwerdt
NSF Graduate Research Fellowship	Michael DiNezza
Science Foundation Arizona (SFAz)	Derek Caselli, Mojtaba Rahmati, Garrett Schlenvogt, Shanshan Wang, Michael DiNezza
University Graduate Fellowship (UGF)	Nabil Ashraf, Seokheun Choi, Robin Daugherty, Shi Liu, Yan Ma, David Olesky, Marcus Schaffer, Xiaonan Shan, Joel Steenis, Kai Tu, Kyle Unger
Cirrus Logic Mixed Signal IC Design Fellowship	Cory Peterson
The Photonics Society of Chinese-Americans Bor-uei Chen Memorial Scholarship	Songnan WU
IEEE Phoenix Section Irv Kaufman Gross Student Scholarship Award	Songnan WU

doctoral graduates

Summer 2010

David Daniel - Design, modeling, simulation, circuit design, and proof-of-concept for transporting PCI data over Ethernet. Chair: J. Hui.

Wenfan Zhou - Sequential processing with sensor scheduling in structural health management. Chair: A. Papandreou-Suppappola.

Debejyo Chakraborty - Time-frequency based adaptive learning for structural health management. Chair: A. Papandreou-Suppappola.

Bhavana Chakraborty - Advancements in waveform design for multiple-input and multiple-output and urban multipath exploitation radar. Chair: A. Papandreou-Suppappola.

Adityavikram Viswanathan - Imaging from Fourier spectral data: Problems in discontinuity detection, non-harmonic Fourier reconstruction and point-spread, function estimation. Co-chairs: A. Gelb and D. Cochran.

Xin Li - Extension, benchmarking and statistical applications of the PSP MOSFET model. Chair: G. Goldenblat.

Hang Song - A mixed-signal matching state search based adaptive antenna turning unit. Chair: B. Bakkaloglu.

Fall 2010

Ilker Deligoz - Adaptive signal to noise ratio scalable analog front-end continuous time sigma delta converter for digital hearing aids. Chair: S. Kiaei.

Durga Gautam - Impact of increased penetration of DFIG based wind turbine generators on rotor angle stability of power systems. Chair: V. Vittal.

Jilin Xia - Charge transport and quantum capacitance of graphene. Chair: N. J. Tao.

Chong Wang - Transmission system restoration strategies in real time. Chair: V. Vittal.

Garrick Ng - Computational studies of 4H and 6H silicon carbide. Chair: D. Schroder

Mahesh Krishna Banavar - Distributed inference over multiple-access channels with wireless sensor networks. Co-chairs: C. Tepedelenlioglu and A. Spanias.

Assad Said - Noise resilient image segmentation and classification methods with applications in biomedical and semiconductor images. Chair: L. Karam.

Adarsh Bangalore

Narasimhamurthy - Asymptotic techniques for space and multi-user diversity analysis in wireless communications. Chair: C. Tepedelenlioglu.

Barrie Lee Kokanos - Power system mode estimation using associate Hermite expansion. Chair: G. Karady.

Ajit Devaraj - Advanced methods in post Cartesian imaging. Co-chairs: L. J. Karam and J. G. Pipe.

Keun-Yong Ban - Study of InAs quantum dots on GaAsSb for intermediate band solar cells. Chair: C. Honsberg.

William Lepkowski - Optimizing the design of partially and fully depleted MESFETs for low dropout regulators. Chair: T. Thornton.

Sadik Kucuksari - Development of models for optical instrument transformers. Chair: G. Karady.

Mohammed Tawab Dastagir - Synthesis and characterization of magnetic nanowires and magnetic thin films. Chair: Hongbin Yu.

Guangyue Xu - Controlled islanding algorithms and demonstrations on the WECC system. Chair: V. Vittal.

Wei Xu - On-chip inductor with integrated magnetic material. Chair: Hongbin Yu.



Spring 2011

Xiaotun Qiu - Environmental sensing applications of zinc oxide based film bulk acoustic resonator. Chair: Hongyu Yu.

Hyun Tae Kim - A CMOS analog front-end IC for gas sensors. Chair: B. Bakkaloglu.

Harish Krishnamoorthi - Incorporating auditory models in speech/audio applications. Chair: A. Spanias.

Sreekar Krishna - Mediated social interpersonal communication: Evidence-based understanding of multimedia solutions for enriching social situational awareness. Chair: S. Panchanathan.

Chi-Chao Wang - Predictive modeling for extremely scaled CMOS and post-silicon devices. Chair: Y. Cao.

Deepak Kamalanathan - Kinetics of programmable metallization cell memory. Chair: M. Kozicki.

Najad Anabtawi - Design of a continuous time sigma delta analog-to-digital converter for operation in extreme environments. Chair: H. Barnaby.

Chandrashekhara Thejaswi Pataguppe Suryanarayan Bhat - The value of information in wireless networks: Opportunistic scheduling, cooperative relaying and multicast. Chair: J. Zhang.

Punarvasu Joshi - Field effect modulation of ion transport in silicon-on-insulator nanopores and their application as nanoscale Coulter counters. Chair: T. J. Thornton.

Minghan Ren - Lateral programmable metallization cell devices and applications. Chair: M. Kozicki.

Palais Award

Dr. Asaad Said received the 2010-2011 Palais Doctoral Award. His doctoral thesis was cited as offering "outstanding contributions in the field of automated image analysis and classification, cancer detection and diagnosis, and industrial automation for semiconductor manufacturing." Dr. Said, whose mentor was Professor **Lina Karam**, is currently a research scientist at Intel Corporation in Chandler, AZ. The Palais Award, established in 2002 by ECEE Professor **Joseph Palais** and his wife, Sandra, is presented annually to the best graduating doctoral student in the electrical engineering program. Candidates must have a minimum 3.75 GPA and at least one journal or conference publication. Faculty members nominate students within the program each year. The recipient receives \$1,500 and a commemorative plaque.



ECEE Director Stephen Phillips (left) presents the Palais Doctoral Award to Dr. Asaad Said.



ECEE Faculty Lead NSF/DOE

Solar Energy Engineering Research Center (ERC)



Arizona State University will lead a new national Engineering Research Center (ERC) supported jointly by the National Science Foundation (NSF) and Department of Energy (DOE) to solve challenges to harnessing solar power in economically viable and sustainable ways.

The ERC for Quantum Energy and Sustainable Solar Technologies – or QESST (www.qesst.org) – will be directed by ECEE Professor **Christiana Honsberg**.

“An expanding global economy is bringing an unquenchable demand for more electrical power. It will become vital to progress throughout the 21st century to have the benefits of alternative energy sources that solar power can provide through photovoltaic technologies,” says Professor Honsberg, who also directs ASU’s Solar Power Lab.

The NSF and DOE will jointly provide funding of \$18.5 million for the first five years of the center, whose mission includes accelerating commercialization of solar energy technologies through partnerships with industry, as well as expanding opportunities for education in energy engineering.



For more information about QESST, visit www.qesst.org

Partner institution collaborators on the ERC are the California Institute of Technology, Massachusetts Institute of Technology, the University of Delaware, and the University of New Mexico. Collaboration between ASU and partner universities will be coordinated by Harry Atwater, a professor of applied physics at Caltech, who will serve as QESST's research director.

ECEE Professor **Sayfe Kiaei**, former associate dean of research for the Ira A. Fulton Schools of Engineering, will be QESST's test bed leader, responsible for developing platforms for evaluating and testing new technologies. Matthew Fraser, an associate professor in ASU's School of Sustainability, will be sustainability director.

More than 40 companies have committed support for QESST, including major manufacturers and companies that produce basic materials, photovoltaic devices and systems, and provide installation of solar energy technology.

The center's efforts will also benefit from ongoing energy research and education collaborations with affiliate partners, including Georgia Tech, the University of Arizona, the University of Houston and the National Renewable Energy Laboratory, and international members, including the University of Tokyo, Imperial College London, and the University of New South Wales.

In addition, QESST will leverage the expertise of other ASU research strengths in centers pursuing advances in power systems and related energy fields. Those include the Power Systems Engineering Research Center (PSERC), the Sensor, Signal and Information Processing center (SenSIP), and Connection One, a wireless communications center – each of which is an NSF Industry/University Cooperative Research Center and headed by ECEE faculty.

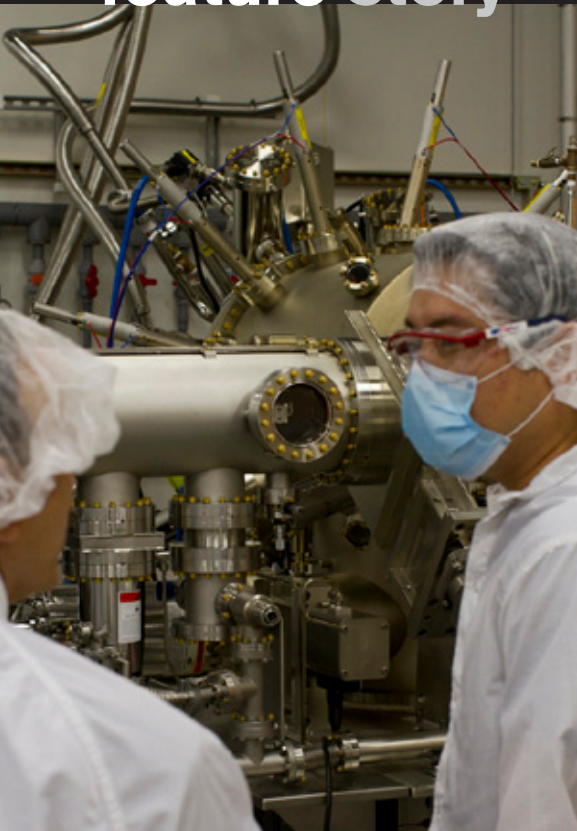
QESST will also partner with the Future Renewable Electric Energy Delivery and Management (FREEDM) Systems center, an NSF Engineering Research Center led by North Carolina State University, in which ASU is a partner institution.

Along with pursuing advances to increase the efficiency of photovoltaic devices for converting sunlight into electrical energy, researchers will develop new manufacturing processes to produce photovoltaic solar power systems at an unprecedented scale that can be integrated into the nation's power grid for widespread energy distribution.



More than 40 companies have committed support for QESST, including major manufacturers and companies that produce basic materials, photovoltaic devices and systems, and provide installation of solar energy technology.

feature story



The overriding goal of the endeavor is to enable photovoltaic technologies to be capable of supplying a majority of new electricity generation in the United States within a decade, as well as providing power for up to 1.5 billion people worldwide who now have little or no access to electrical energy.

“All members of the QESST leadership team have experience in industry, with start-up companies and with technology transfer from the lab to the marketplace,” Honsberg says.

The distinctive factor in the QESST endeavor will be in applying quantum mechanics to the development of advanced photovoltaic technologies and energy generation systems that convert sunlight to energy more efficiently. These energy systems will be designed for integration into homes and offices, while also cleaning the atmosphere. Through this approach, QESST will seek to fundamentally alter how energy is used in the future, Honsberg says.

The overriding goal of the endeavor is to enable photovoltaic technologies to be capable of supplying a majority of new electricity generation in the United States within a decade, as well as providing power for up to 1.5 billion people worldwide who now have little or no access to electrical energy. The key lies in making innovations to photovoltaic systems while keeping costs at sustainable levels, Honsberg says.

A major impact of successfully developing the technologies to achieve QESST’s goal, Kiaei says, will be expanded opportunities for U.S.-based businesses to capture a large portion of the estimated future trillion-dollar global energy industry.

QESST is also focused on another strategic goal: to improve engineering education and expand the community that is engaged in energy research and education. The center’s education director is Jenefer Husman, an associate professor in ASU’s School of Social and Family Dynamics. “ASU and our partner institutions will help produce the next generation of sustainability-focused solar engineers,” says Husman.

NSF-sponsored ERCs focus on areas of research considered vital to national interests in science and engineering innovation, technological advancement, economic expansion and education of future innovation leaders.

Selection of ASU as a lead institution for an NSF-sponsored ERC reflects the exceptional regard for the expertise of the university’s faculty in important areas of research.

ASU and Engineering get high marks in national standings

In a September 2010 *Wall Street Journal* survey, ASU was ranked among the top 25 schools nationally by job recruiters looking for new graduate recruits. At #5, ASU was cited for “its strong ties between employees and professors.”

The ranked schools in the survey were selected based on having the best-qualified students, and who were considered “among the most prepared and well-rounded academically.” The survey stated that companies were finding that students from large public universities fit well into corporate cultures and were seen to have the best track record in these environments. It also suggested a trend among recruiters, who are shifting their focus from private elite colleges to public universities for prospective employees.

In another report, the National Research Council (NRC), under the National Academies of Sciences, gave several ASU programs, including electrical engineering, the highest ratings for excellence in their doctoral programs. Peer universities that ranked with ASU's electrical engineering program were University of Southern California, Carnegie Mellon, Ohio State, and Johns Hopkins.

Factors considered included faculty research productivity; books, scholarly publications, honors and awards; institutional support for students and completion rates; and the diversity of faculty and students, among other characteristics.

The report is based on data collected in 2005 and considers the 25 programs in the social sciences, humanities, natural sciences, and engineering submitted by ASU for consideration.





Grants aid **energy** and **materials** research

A \$5.5 million Department of Energy (DOE) funding grant was awarded to the Power Systems Energy Research Center (PSERC) to investigate requirements for a systematic transformation of today's electric grid. The DOE funding is expected to help map a future trajectory for the nation's energy system. "PSERC researchers will use their knowledge of today's operating and planning paradigms for electric power grids, as well as their knowledge of the technologies and market systems as the starting point for new paradigms and transition strategies," says PSERC Director, Professor **Vijay Vittal**. Headquartered at ASU, PSERC is a multidisciplinary collaboration of 14 universities and more than 35 industry partners.

ECEE Senior Research Scientist **Shane Johnson** and ECEE Professor **Yong Hang Zhang** are part of a multi-university team awarded a five-year, \$6.5 million Department of Defense Multi-University Research Initiative (MURI) grant. The ASU team, consisting of Johnson, Zhang, and ASU Regents' Professor David J. Smith from the Department of Physics, will receive \$2.34 million for its part of the effort. The grant will be used to extend knowledge of basic properties of materials for the construction of lasers and infrared photodetectors, and to study the origins of defects in the materials and ways to reduce them. The goal is to generate advances in semiconductors, infrared photodetectors, and imaging systems. This is the third MURI program grant awarded to ASU researchers in the past several years in semiconductor optoelectronics and photonics.

As ASU strives to become America's Solar University, the steel frames to support the solar panels are going up in Lot 59 as part of the Power Parasol. When completed the solar panels are expected to produce over 3500 Megawatt-hours annually. This system will offset over 2.8 million pounds of CO2 and make a significant contribution towards ASU's goal of achieving a zero carbon footprint.



Connection One:

Integrated Circuits and Systems Research Center

Director: Sayfe Kiaei;
Associate Director: Bertan Bakkaloglu

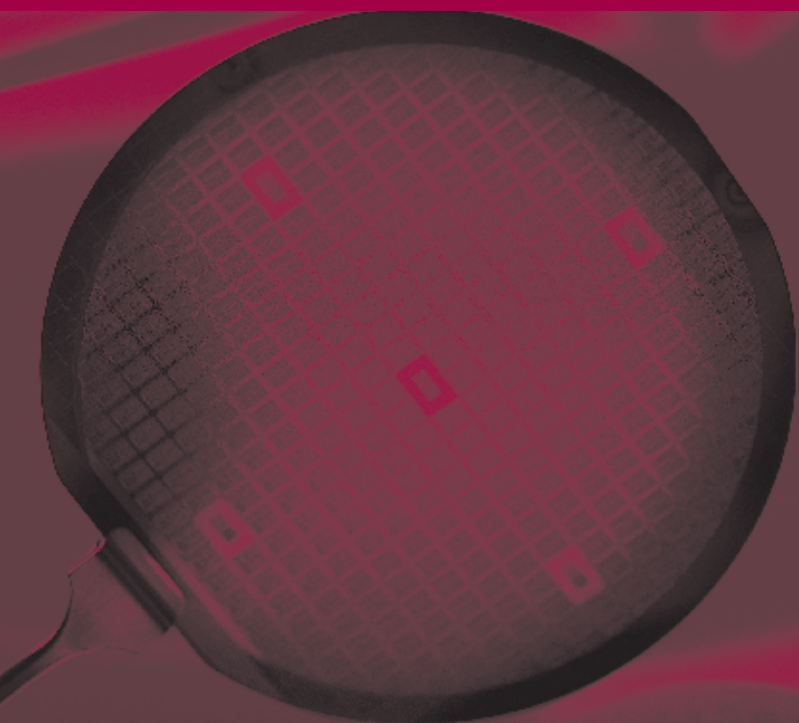
Connection One is a National Science Foundation Industry/University Cooperative Research Center (I/UCRC) that is focused on developing the next generation of wireless systems, integrated systems and sensors on a chip, and bio-electronics systems. Connection One has over 30 industrial/governmental members, 4 university partners, over 25 faculty members, and over 75 PhD students. The Center's research focus is on a broad range of topics, including antenna design, radio frequency integrated circuits, power management IC, analog and digital IC, modeling and CAD, MEMS, radiation hard electronics, sensor circuits, and ultra-low power smart sensors.

ASU is the lead university, partnering with the University of Arizona, the University of Hawaii, Rensselaer Polytechnic University, and The Ohio State University. Partnering industry collaborators and government agencies include: Air Force Research Labs, Army Research Labs, Analog Devices, Broadcom, C9 Corp., CERDEC (U.S. Army), Cirrus Logic, Department of Homeland Security, Esensors Inc., Freescale Semiconductor, Guide Star Engineering LLC, Goodrich Aerospace, Litepoint, Motorola, NewWave Sensor Solutions LLC, Office of Naval Research, Opcoast, Qualcomm, Raytheon, Sensor Electronic Technology Inc., Space Micro Inc., Texas Instruments, Timbre/TEL, Tracer Diagnostic Systems Inc., Vixar Inc., and Zomega Terahertz Corp.

www.connectionone.org

Highlights, 2010-2011:

- Connection One researchers are working with the newly established ASU **QESST ERC** (see feature story) to develop new power electronics systems to improve efficiency and reliability of the integrated power electronic systems.
- Several NSF grant awards were won by Connection One faculty:
 - "Microwave stethoscope: A novel non-invasive microwave sensor for monitoring human vital signs" to Professors **Kiaei** and **Bakkaloglu**, and University of Hawaii faculty, Nuri Celik and Magdy Iskander.
 - "SHF: Small Collaborative Research: Unified framework for adaptive analog and digital performance characterization using learned information from the circuit under test" to Professors **Sule Ozev** and Linda Milor from the Georgia Institute of Technology.
 - "I/UCRC GOALI Fundamental Research: Autonomous self-healing sensor network radio and mixed-signal readout system design" to Professors **Kiaei**, **Ozev**, and **Bakkaloglu**.
- Faculty received grants from the Semiconductor Research Corporation and Intel:
 - "Electrical stimulus-based built-in self-characterization for calibration and process feedback of MEMS devices" to Professors **Ozev**, **Bakkaloglu**, and **Kiaei**.
 - "Single set-up detailed testing of wireless transceiver front-ends using digital processing" to Professor **Ozev**.
 - Two grants to Professors **Hongbin Yu** and **Hanqing Jiang** on magnetics and sensitive sensors for semiconductor chip strain characterization.
- Professor **Ozev** won an Honorable Mention Award at the International Test Conference for her 2010 publication (E. Yilmaz, S. Ozev, and K. M. Butler, "Adaptive test flow for mixed-signal/RF circuits using learned information from device under test").



PSERC:

Power Systems Engineering Research Center

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.

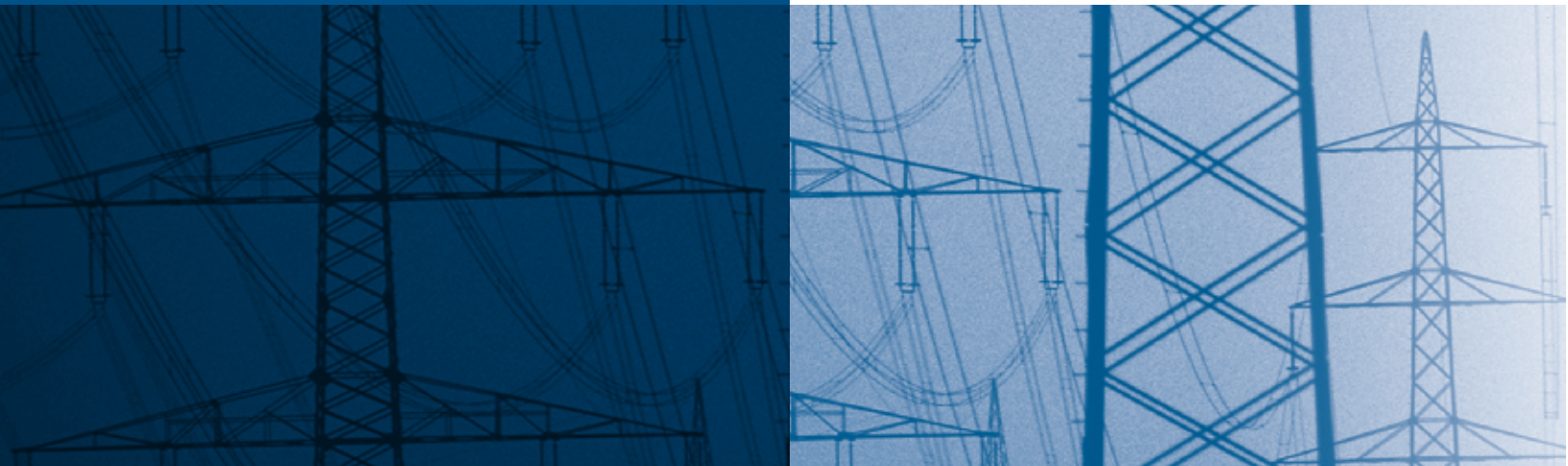
The multidisciplinary expertise of PSERC's researchers includes power systems, applied mathematics, complex systems, computing, control theory, power electronics, operations research, non-linear systems, economics, industrial organization and public policy. PSERC partners with private and public organizations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

www.pserc.org

Highlights, 2010-2011:

- A \$5.5 million Department of Energy (DOE) funding grant was awarded to PSERC to investigate requirements for a systematic transformation of today's electric grid. (See feature story news item.)
- PSERC published three white papers providing research and education perspectives on important issues facing the electric power industry, customers, and policy-makers. The white papers, available at www.pserc.wisc.edu/research/white_papers, are titled:
 - U.S. energy infrastructure investment: Large-scale integrated smart grid solutions with high penetration of renewable resources, dispersed generation, and customer participation.
 - Challenges in integrating renewable technologies into an electric power system.
 - U.S. energy infrastructure investment: Long-term strategic planning to inform policy development.



SenSIP:

Sensors, Signal and Information Processing Center

Director: Andreas Spanias

SenSIP is a designated ABOR (Arizona Board of Regents) center. SenSIP is established as an Industry/University Cooperative Research Center (I/UCRC) in partnership with the Texas Net-Centric I/UCRC. Full membership industry partners include Intel, Lockheed Martin, National Instruments, Raytheon Missile Systems, LG Electronics, IQ Engines, and Brainstorm Technology. Members-at-large include Acoustic Technologies, Boeing, Cisco, General Dynamics, Freescale, HP, Paceco, PSG, Qualcomm, and Sprint Communications.

The center is focused on state-of-the-art research in integrated sensing and processing and wireless sensor networks. SenSIP houses several multidisciplinary research grants in biosensing, communications, networks, signal and information processing, energy and defense applications, non-linear dynamics, and controls. SenSIP's collaborators include the School of Arts, Media and Engineering (AME), ASU Biodesign Institute, and the Security & Defense Systems Initiative (SDSI). International university collaboration agreements were signed with ETH, Imperial College, Polytechnic Milan, University of British Columbia, and the University of Cyprus.

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

sensip.asu.edu

Highlights, 2010-2011:

- SenSIP is officially an NSF I/UCRC site with \$360,000 funding for five years and \$750,000 in industry matching.
- IQ Engines and Brainstorm Technology sign member agreements with SenSIP.
- Jointly with the ASU's Center for Solid State Electronics, SenSIP obtains a British Council grant for collaborative research with University Research Defence Centre, Imperial College.
- SenSIP and AME finalize research agreement with Sprint Communications for the donation of a 4G system valued at \$300,000.
- New NSF grants and supplements were awarded to Professors **Duman, Lai, Tsakalis, Iasemidis, Papandreou-Suppappola, Tepedelenioglu, J. Zhang, and Y. Zhang.**
- SenSIP faculty received several industry and foundation grants: to Professors **Reisslein** and **Y. Zhang** from LG Electronics; to Professor **Karam** from Intel; to Professor **Tepedelenioglu** from Mitsui for signal processing for utility-scale solar panel array monitoring; to Professor **Frakes** from Lockheed Martin; to Professor **Spanias** from the Cyprus Research Promotion Foundation on Intelligent Systems and Networks; and to Professor **Duman** from the Qatar research fund.
- SenSIP collaborates with ASU's Global Institute of Sustainability on a large NSF STC grant application.
- An education iPhone/iPad app is developed and tested by faculty and students.
- The SenSIP software J-DSP/Earth Systems edition is used in an international sustainability workshop in collaboration with Johns Hopkins University.

SenSIP News is also on Facebook and Twitter:
<http://twitter.com/asusensip>

ASU LightWorks

Director: Gary Dirks

Deputy Director: Stephen Goodnick

LightWorks is a university-wide initiative that pulls together light-inspired research at ASU under one strategic framework. LightWorks consists of 17 research centers and labs focused on a diverse range of energy research issues in bioenergy, photovoltaics, solar thermal, fuel cell/energy storage, and energy system testing, as well as cutting-edge research in computational nanoscience and nanophotonics for biological, medical, and energy applications. Under this initiative, ASU faculty are investigating and developing reliable, affordable, and renewable energy sources and storage suitable for commercialization in the Southwest United States.

LightWorks brings together a broad base of ASU talent and expertise from engineering, physics, chemistry, biosciences, as well as the social sciences. Dr. Gary Dirks, former president of BP Asia-Pacific and president of BP China, is the director. He holds the Julie A. Wrigley Chair for the Practice of Sustainable Energy Systems at ASU's School of Sustainability where he is a teaching faculty and scientist. ECEE Professor Stephen Goodnick is the deputy director.

asulightworks.com

LightWorks is comprised of several centers, with ECEE faculty providing leadership:

The Solar Power Laboratory **Director: Christiana Honsberg**

The Solar Power Lab is focused 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.

Center for Computational Nanoscience **Directors: Marco Saraniti and** **Mark van Schilfgaarde**

The Center for Computational Nanoscience provides the infrastructure that brings together researchers across campus working on modeling and simulation of nanoscale systems. Typical projects focus on the development of novel numerical methods and algorithms, as well as applications to the study of phenomena with nanoscale resolution. Examples include the simulation of biomimetic nanodevices, design and optimization of ultrafast electron devices, and the study of the physical properties of novel materials for the microelectronic industry. Of particular relevance for the center is the study of phenomena that originate at the nanoscale, but evolve on much greater time and space domains. The center's research activities receive funding from the Department of Defense, the Department of Energy, the National Science Foundation, and from many industries such as Intel and Northrop Grumman.

Center for Photonics Innovation **Director: Yong-Hang Zhang**

The Center for Photonics Innovation integrates a broad spectrum of research areas, ranging from the fundamental study of photon-matter interactions to practical devices, such as solar cells, lasers, and optical sensors for medical and biological applications. The center's goal is to seamlessly integrate education and research, while offering a high standard of scholarship as well as opportunities for promoting technology commercialization. The center has been awarded three prestigious multimillion-dollar MURI grants in recent years (see feature story item) and has received several DARPA research contracts leading to many milestone achievements.

Other centers in LightWorks include:

- The **Center for Bioenergy and Photosynthesis**, which pursues transdisciplinary research in the use of biological and artificial systems based on biological principles.
- The **Center for Renewable Energy Electrochemistry**, which researches renewable electrochemically-based energy storage and conversion research for improved electrochemical performance through alternative electrolytes, such as ionic liquids as well as new catalysts in non-acid based electrolytes.
- ASU's **Tubes in the Desert** project, which investigates 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, which researches algae samples as a renewable and sustainable source of oil for biodiesel and other bioproducts.
- Cross-disciplinary efforts that address the energy grid infrastructure, supply chain, policy and transition involve participation of many participation of many ASU centers, academic programs, and institutes, including the **Decision Theater, Center for Solid State Sciences, Flexible Display Center, Power Systems Engineering Research Center, Photovoltaics Lab, Consortium for Science Policy Outcomes** and **Arizona Technology Enterprises**.

Highlights, 2010-2011:

- Arizona State University will lead a new national **Engineering Research Center (ERC)** supported jointly by the National Science Foundation (NSF) and Department of Energy (DOE) to solve challenges to harnessing solar power in economically viable and sustainable ways. The NSF and DOE will jointly provide funding of \$18.5 million for the first five years of the center's operations. The ERC will be directed by ECEE Professor Christiana Honsberg. (See feature story.)
- A panel discussion titled, "A Forum on New Energy," was held April 1, 2010 at the National Press Club in Washington. ASU President **Michael Crow** was the moderator and guest participants included **Gary Dirks**, Director of LightWorks, Arun Majumdar, Director ARPA-E, Department of Energy, and Lisa Morgonelli, Director of Policy Initiative at the New American Foundation. The discussion centered on issues arising from the intersection of the promise renewable energy and realities presented by the markets, technology limitations, and environmental policies.

Director: Trevor Thornton

www.fulton.asu.edu/nanofab

ASU NanoFab is part of the NSF-supported **National Nanofabrication Infrastructure Network (NNIN)** and functions as the Southwest regional node. NNIN is a partnership of 14 user facilities for nanoscience and nanotechnology research in universities across the country. It provides extensive support in nanoscale fabrication, synthesis, characterization, modeling, design, computation and hands-on training, available to all qualified users. NNIN also supports elementary to adult level education programs through teacher training, educational tools and resources, and career guidance programs that promote science and engineering.

The NanoFab facility at ASU is a multi-user, multi-disciplinary facility open to internal and external users. It is operated by the Center for Solid State Electronics Research (CSSER) within the Ira A. Fulton Schools of Engineering. Research activities at the NanoFab facility in recent years have included nanostructures, nanoionics, nanophotonics, bioMEMS, and molecular electronics. Its core strengths are in the areas of nanofabrication, CMOS processing, molecular- and bio-electronics, MEMS, nano-fluidics, benign semiconductor processing, optoelectronics, and device characterization.

Center for Applied Nanoionics

Director: Michael N. Kozicki

www.asu.edu/aime/index.htm

The Center for Applied Nanoionics lies at the cutting edge of worldwide research in materials and devices that rely on ion transport and chemical change at the nanoscale. Whereas nanoelectronics involve the movement of electrons within their nanostructured settings, nanoionics concern materials and devices that rely on ion transport and chemical change at the nanoscale. Rising interest in nanoionics has been fueled by the wide range of demonstrated and potential applications so that the field has been equated in significance by some with nanoelectronics. Outreach into the educational, research and industrial communities is a significant part of CANI's work.



James T. Aberle

Associate Professor, PhD, University of Massachusetts
 aberle@asu.edu; (480) 965-8588

Research Expertise: Antennas and RF systems for wireless communications, modeling of complex electromagnetic phenomena

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, NY, where he worked on the development of wide-band phased array antennas. As a graduate research assistant at the University of Massachusetts from 1985 to 1989, Aberle 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, Professor 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).

Selected Publications:

Hang Song, J. T. Aberle, and B. Bakkaloglu, "A mixed-signal matching state search based adaptive antenna tuning IC," *IEEE Microwave and Wireless Components Letters*, vol. 20, no. 10, pp. 581-583, Oct. 2010.

Hang Song, B. Bakkaloglu, and J. T. Aberle, "A CMOS adaptive antenna-impedance-tuning IC operating in the 850MHz-to-2GHz band," *Solid-State Circuits Conference - Digest of Technical Papers, 2009, ISSCC 2009. IEEE International*, 385a, pp. 384-385, 8-12 Feb. 2009.

J. T. Aberle, "Two-port representation of an antenna with application to non-foster matching networks," *IEEE Transactions on Antennas and Propagation*, vol. 56, no. 5, pp. 1218-1222, May 2008.

J. T. Aberle, S.-H. Oh, and G. A. Taylor, "Frequency-agile antennas for a software-defined and cognitive radio," in *Printed Antennas for Wireless Communications*, R. Waterhouse, Ed. John Wiley and Sons, 2007, pp. 379-406.



David R. Allee

Professor, PhD, Stanford University
 allee@asu.edu; (480) 965-6470

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

Dr. David R. Allee (BS in Electrical Engineering, University of Cincinnati; MS and PhD in Electrical Engineering, Stanford University) is a professor of electrical engineering at Arizona State University. While at Stanford University, and as a research associate at Cambridge University, he fabricated field effect transistors with ultra-short gate lengths using custom e-beam lithography and invented several ultra-high resolution lithography techniques. Since joining Arizona State University, his focus has been on mixed signal integrated circuit design. Professor Allee is currently Director of Research for Backplane Electronics for the Flexible Display Center (flexdisplay.asu.edu) funded by the Army, and he is investigating a variety of flexible electronics applications. He has been a regular consultant with several semiconductor industries on low voltage and low power mixed signal CMOS circuit design. He has co-authored over 100 archival scientific publications and patents.

Selected Publications

Manuel Quevedo, S. Gowrisanker, D. Allee, S. Venugopal, R. Krishna, K. Kaftanoglu, H. N. Alshareef, and B. E. Gnade, "Novel materials and integration schemes for CMOS-based circuits for flexible electronics," *Electrochemical Society Transactions*, vol. 25, no. 7, issue title: ULSI Process Integration 6, pp. 503-511, 2009

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

David R. Allee, Lawrence T. Clark, Bryan D. Vogt, Rahul Shringarpure, Sameer M. Venugopal, Shrinivas Gopalan Uppili, Korhan Kaftanoglu, Hemanth Shivalingaiah, Zi P. Li, J. J. Ravindra Fernando, Edward J. Bawolek, and Shawn O'Rourke, "Degradation effects in a-Si:H thin film transistors and their impact on circuit performance," *IEEE Transactions on Electron Devices*, vol. 56, no. 6, pp. 1166-1176, June 2009.

Rahul Shringarpure, Sameer Venugopal, Lawrence T. Clark, David R. Allee, Edward Bawolek, "Localization of gate biased induced threshold voltage degradation in a-Si:H TFTs," *IEEE Electron Device Letters*, vol. 29, no. 1, pp. 93-95, 2008.



Raja Ayyanar

Associate Professor, PhD, University of Minnesota
 rayyanar@asu.edu; (480) 727-7307

Research Expertise: 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

Rajapandian Ayyanar joined the Arizona State University 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 he holds two U.S. patents. Professor Ayyanar was awarded the ONR Young Investigator Award in 2005.

Selected Publications:

D. Gautam, L. Goel, R. Ayyanar, V. Vittal, and T. Harbour, "Control strategy to mitigate the impact of reduced inertia due to doubly fed induction generators on large power systems," *IEEE Transactions on Power Systems*, vol. 26, pp. 214-224, Feb. 2011.

A. K. Jain, R. Ayyanar, "PWM control of dual active bridge: Comprehensive analysis and experimental verification," *IEEE Transactions on Power Electronics*, vol. 26, pp. 1215-1227, Apr. 2011.

K. Basu, J. S. S. Prasad, G. Narayanan, H. K. Krishnamurthy, and R. Ayyanar, "Reduction of torque ripple in induction motor drives using an advanced hybrid PWM technique," *IEEE Transactions on Industrial Electronics*, vol. 57, pp. 2085-2091, June 2010.

D. Zhao, V. S. S. Pavan Kumar Hari, G. Narayanan, and R. Ayyanar, "Space-vector-based hybrid pulsewidth modulation techniques for reduced harmonic distortion and switching loss," *IEEE Transactions on Power Electronics*, vol. 25, pp. 760-774, Mar. 2010.

R. Ayyanar, H. K. Krishnamurthy, and X. Mao, "Optimal variable switching frequency scheme for reducing switching loss in single-phase inverters based on time-domain ripple analysis," *IEEE Transactions on Power Electronics*, vol. 24, pp. 991-1001, Apr. 2009.

R. Ayyanar and N. Mohan, "Zero Voltage Switching DC-DC Converter," U.S. Patents 6,611,444 and 6,310,785.



Bertan Bakkaloglu

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Research Expertise: RF and mixed-signal IC design, integrated power management circuits for high reliability applications, biomedical and chemical instrumentation ICs

Bertan Bakkaloglu joined the Arizona State University faculty in August 2004. He received a PhD in electrical and computer engineering in 1995 from Oregon State University. Prior to ASU, Professor 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.

Selected Publications:

W. Khalil, S. Shashidharan, T. Copani, S. Chakraborty, S. Kiaei, and B. Bakkaloglu, "A 405-MHz all-digital fractional-frequency-locked loop for ISM band applications," IEEE Transactions on Microwave Theory and Techniques, vol. 59, no. 5, pp. 1319-1326, May 2011.

T. Copani, S. Min, S. Shashidharan, S. Chakraborty, M. Stevens, S. Kiaei, and B. Bakkaloglu, "A CMOS low-power transceiver with reconfigurable antenna interface for medical implant applications," IEEE Transactions on Microwave Theory and Techniques, vol. 59, no. 5, pp. 1369-1378, May 2011.

R. Sengupta, B. Vermeire, L. T. Clark, and B. Bakkaloglu, "A 133 MHz radiation-hardened delay-locked loop," IEEE Transactions on Nuclear Science, vol. 57, no. 6, pp. 3626-3633, Dec. 2010.

K. Chandrashekar, M. Corsi, J. Fattaruso, and B. Bakkaloglu, "A 20-MS/s to 40-MS/s reconfigurable pipeline ADC implemented with parallel OTA scaling," IEEE Transactions on Circuits and Systems, vol. 57, no. 8, pp. 602-606, Aug. 2010.



Constantine A. Balanis

Regents' Professor, PhD, The Ohio State University
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Research Expertise: 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, and smart/adaptive antennas for wireless communications

Constantine A. Balanis joined the electrical engineering faculty in 1983 and is now an ASU Regents' Professor. He has published over 135 journal papers, 235 conference papers, 12 book chapters, 8 magazine/newsletter papers, and numerous scientific reports. He has also published four books: *Antenna Theory: Analysis and Design*; *Advanced Engineering Electromagnetics*; *Introduction to Smart Antennas*; and *Modern Antenna Handbook*.

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

Selected Publications:

V. Kononov and C. A. Balanis, "Analysis and simulation of the propagation channel complexity on signal fading," IEEE Antennas and Wireless Letters, vol. 9, pp. 895-898, 2010.

V. Kononov, C. A. Balanis, C. R. Birtcher, and C. Polycarpou, "Non-uniform field modeling of ferrite-loaded cavity-backed slot antennas," IEEE Trans. Antennas Propagat., vol. 57, no. 10, pp. 3402-3405, 2009.

P. Bevelacqua and C. A. Balanis, "Geometry and weight optimization for minimizing sidelobes in wideband planar arrays," IEEE Trans. Antennas Propagat., vol. 57, no. 4, pp. 1285-1289, Apr. 2009.

C. A. Balanis, D. DeCarlo, and J. Lambert, "Spherical cap adaptive antennas for GPS," IEEE Trans. Antennas Propagat., vol. 57, no. 2, pp. 406-413, Feb. 2009.

C. A. Balanis, C. R. Birtcher, and B. Yang, "The effects of passengers on mutual coupling in a simplified fuselage: Simulations and measurements," IEEE Trans. Electromagnetic Compatibility, vol. 50, no. 3, part II, pp. 751-754, Aug. 2008.



Hugh Barnaby

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

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, Professor Barnaby has ongoing research activities in wireless (RF and optical) IC and data converter design, radiation-enabled compact modeling, and memristor technologies and applications. He has been an active researcher in the microelectronics field for 18 years in both industry and academics, presenting and publishing more than 100 papers during this time.

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:

I. S. Esqueda, H. J. Barnaby, M. L. McLain, P. C. Adell, F. E. Mamouni, S. K. Dixit, R. D. Schrimpf, and W. Xiong, "Modeling the radiation response of fully-depleted SOI n-channel MOSFETs," IEEE Trans. on Nuclear Science, vol. 56, no. 4, pp. 2247-2250, 2009.

X. J. Chen, H. J. Barnaby, P. Adell, R. L. Pease, B. Vermeire, and K. E. Holbert, "Modeling the dose rate response and the effects of hydrogen in bipolar technologies," IEEE Trans. on Nuclear Science, vol. 56, no. 6, pp. 3196-3202, 2009.

W. Chen, T. Copani, H. J. Barnaby, and S. Kiaei, "A 14-GHz CMOS receiver with local oscillator and IF bandpass filter for satellite applications," 2009 IEEE Radio Frequency Integrated Circuits Symposium, June 7-9, 2009, pp. 123-126.

M. L. McLain, H. J. Barnaby, I. S. Esqueda, J. Oder, and B. Vermeire, "Reliability of high performance standard two-edge and radiation hardened by design enclosed geometry transistors," 2009 IEEE International Reliability Physics Symposium Proceedings, April 26-30, 2009, pp. 174-179.



Jennifer M. Blain Christen

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Research Expertise: Bio-compatible integration techniques for CMOS electronics, microfluidics and soft lithography, MEMS devices with emphasis on bio-MEMS, analog and mixed-mode VLSI for bio-medical/analytical instrumentation including SOS/SOI technologies

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

Honors and Distinctions: Transactions on Biomedical Circuits and Systems Best Paper Award (2007-2010); 2010 Science Foundation Arizona Grand Challenges Conference Poster Contest 1st Place; STIMESI MultiMEMS Design Contest, Advanced Category 1st Place, 2008; National Science Foundation Graduate Teaching Fellows in K-12 Education, 2005-2006; National Science Foundation Graduate Research Fellowship, 2001-2004; Grant recipient for the Undergraduate Engineering Research Opportunities Program, sponsored by General Electric Faculty for the Future, 1998; Maryland Scholars Award, 1997.

Selected Publications:

- A. G. Andreou, Z. Zhang, R. Ozgun, E. Choi, Z. Kalayjian, M. Marwick, J. Blain Christen, and L. Tung, "Contactless fluorescence imaging with a CMOS image sensor," 2011 IEEE International Symposium on Circuits and Systems, May 2011.
- D. Welch and J. Blain Christen, "A multiparametric biosensor array for on-chip cell culture with feedback controlled microfluidics," 2011 IEEE International Symposium on Circuits and Systems, May 2011.
- J. Song, D. Welch, and J. Blain Christen, "A fully-adjustable dynamic range capacitance sensing circuit in a 0.15 um 3D SOI process," 2011 IEEE International Symposium on Circuits and Systems, May 2011.
- D. Welch and J. Blain Christen, "On-chip biosensing with microfluidic feedback control," IEEE/NIH 5th Life Science Systems and Applications Workshop (LISSA 2011), April. 2011.



Yu (Kevin) Cao

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

Kevin Cao joined the ASU faculty in 2004. He received a PhD in electrical engineering in 2002 and an MA in biophysics in 1999 from the University of California, Berkeley, and conducted his post-doctoral research at the Berkeley Wireless Research Center. He has published more than 150 articles and has 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.

Honors and Distinctions: Teaching Excellence Award, Ira. A. Fulton Schools of Engineering, ASU, 2010; Promotion and Tenure Faculty Exemplar, ASU, 2009; Distinguished Lecturer of the IEEE Circuits and Systems Society, 2009; Chunhui Award for Outstanding Oversea Chinese Scholars, China, 2008; Best Paper Award at the International Low-Power Electronics and Design, 2007; IBM Faculty Award, 2007 and 2006; NSF Faculty Early Career Development (CAREER) Award, 2006; Best Paper Award at the International Symposium on Quality Electronic Design, 2004; Beatrice Winner Award, International Solid-State Circuits Conference, 2000; Biophysics Graduate Program Fellowship at the University of California, Berkeley, 1997-98; UC Regents Fellowship at University of California, Santa Cruz, 1996-97.

Selected Publications:

- W. Wang, S. Yang, S. Bhardwaj, R. Vattikonda, S. Vrudhula, F. Liu, and Y. Cao, "The impact of NBTI effect on combinational circuit: modeling, simulation, and analysis," IEEE Transactions on VLSI Systems, vol. 18, no. 2, pp. 173-183, 2010.
- T. Austin, V. Bertacco, Y. Cao, and S. Mahlke, "Reliable systems on unreliable fabrics," IEEE Design & Test of Computers, vol. 25, no. 4, pp. 322-332, July-Aug, 2008.
- B. H. Calhoun, Y. Cao, X. Li, K. Mai, L. T. Pileggi, R. A. Rutenbar, and K. L. Shepard, "Digital circuit design challenges and opportunities in the era of nanoscale CMOS," Proceedings of the IEEE, vol. 96, no. 2, pp. 343-365, Feb. 2008.



Junseok Chae

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Research Expertise: Micro-electromechanical-systems sensors/actuators, micro-EMS packaging, hybrid integration from nano to micro, micro to macro-worlds, and bio-MEMS

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 post-doctoral research fellow at WIMS (Wireless Integrated MicroSystems) ERC (Engineering Research Center), University of Michigan. His areas of interests are MEMS sensors, integration of nanostructures on MEMS, MEMS packaging, and bio-MEMS. He has published over 60 conference/journal articles and book chapters. He holds a couple of U.S. patents and is a recipient of the NSF CAREER Award on a MEMS protein sensor array.

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:

- X. Zhang, W. Xu, and J. Chae, "Temperature effects on a high Q FBAR in liquid," Sensors and Actuators A, vol. 166, no. 2, pp. 264-268, 2011.
- I. Deligoz, S. Naqvi, T. Copani, S. Kiaei, B. Bakkaloglu, S. Je, and J. Chae, "A MEMS based power scalable hearing aid analog front-end," IEEE Transactions on Biomedical Circuits and Systems, vol. 5, no. 3, pp. 201-213, 2011.
- S. Choi, R. Wang, A. Lajevardi-Khosh, and J. Chae, "Using competitive protein adsorption to measure fibrinogen in undiluted human serum," Applied Physics Letters, vol. 97, pp. 253701, 2010.
- Y. Yang and J. Chae, "Dual-column mini-separator to separate alpha-fetoprotein from fibrinogen and immunoglobulin," IEEE Journal of Microelectromechanical Systems, vol. 19, no. 5, pp. 1041-1049, 2010.
- S. Choi and J. Chae, "Methods of reducing non-specific adsorption in microfluidic biosensors," Journal of Micromechanics and Microengineering, vol. 20, 075015, 2010.
- W. Xu, S. Choi, and J. Chae, "A contour-mode film bulk acoustic resonator of high quality factor in a liquid environment for biosensing applications," Applied Physics Letters, vol. 96, 053703, 2010.



Chaitali Chakrabarti

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

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

Honors and Distinctions: Best Paper Awards in SAMOS'07, MICRO'08, and SiPS'10; MICRO Top Picks in 2007 and 2010; Outstanding Educator Award, IEEE Phoenix section, 2001.

Selected Publications:

M. Woh, S. Seo, S. Mahlke, T. Mudge, and C. Chakrabarti, "AnySP: Anytime anywhere anyway signal processing," IEEE MICRO Top Picks, pp. 81-91 Jan./Feb. 2010.

L. Miao, J. J. Zhang, C. Chakrabarti, and A. Papandreou-Suppappola, "A new parallel implementation for particle filters and its application to adaptive waveform design," IEEE Workshop on Signal Processing Systems (SiPS), pp. 19-24, Oct. 2010, (Bob Owens Memorial Best Paper Award).

J. S. Kim, L. Deng, P. Mangalagiri, K. Irick, K. Sobti, M. Kandemir, V. Narayanan, C. Chakrabarti, N. Pitsianis, and X. Sun, "An automated framework for accelerating numerical algorithms on reconfigurable platforms using algorithmic/architectural optimizations," IEEE Transactions on Computers, pp. 1654-1667, Dec. 2009.

J. Zhuo, C. Chakrabarti, K. S. Lee, N. Chang, and S. Vrudhula, "Maximizing the lifetime of embedded systems powered by fuel-cell battery hybrids," IEEE Transactions on VLSI Systems, pp. 22-32, Jan. 2009.

M. Woh, Y. Lin, S. Mahlke, T. Mudge, C. Chakrabarti, R. Bruce, D. Kershaw, and K. Flautner, "From SODA to scotch: The evolution of a wireless baseband processor," Proc. of IEEE/ACM Symposium on Microarchitecture (MICRO), November 2008, (Best Paper Award).



Lawrence T. Clark

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

Lawrence T. Clark worked at Intel Corporation after receiving his BS in computer science in 1983. While completing his PhD he worked at VLSI Technology Inc. designing PC chipsets. He received his PhD in 1992 after receiving his MS in 1987, both in electrical engineering from Arizona State University. He re-joined Intel in 1992. He joined ASU in August 2004. Professor Clark has been awarded 70 patents, with approximately 20 pending. He has published over 90 peer-reviewed technical papers. He has approximately 15 years of industry experience in various aspects of chipset, CMOS imager, microprocessor design, test engineering, and TCAD. He contributed to the Pentium, Itanium, and XScale microprocessor designs. Most recently, he was a principal engineer and circuit design manager for the Intel XScale microprocessor designs. He has been a consultant to SuVolta Inc. since 2009.

Honors and Distinctions: Senior member, IEEE; Previous associate editor, IEEE Transactions on Circuits and Systems II; Previous guest editor, IEEE Journal of Solid State Circuits; Recipient of the Intel Achievement Award and multiple Intel divisional recognition awards; Technical committee member for IEEE Custom Integrated Circuits Conference, IEEE Nuclear and Space Radiation Effects Conference, and for the International Symposium on Low Power Electronics and Design.

Selected Publications:

S. K. Maurya and L. Clark, "A dynamic longest prefix matching content addressable memory for IP routing," IEEE Trans. on VLSI Systems, vol. 19, no. 6, pp. 963-972, June 2011.

X. Yao, D. Patterson, K. Holbert, and L. Clark, "A 90 nm bulk CMOS radiation hardened by design cache memory," IEEE Trans. Nuc. Science, vol. 57, no. 4, pp. 2089-2097, Aug. 2010.

L. Clark and G. Sampson, "Low power critical timing race free programmable logic arrays," IEEE J. Solid State Circuits, vol. 44, no. 3, pp. 935-946, Mar. 2009.

D. Allee, E. Bawolek, L. Clark, J. Fernando, Z. Li, K. Kaftanoglu, S. O'Rourke, H. Shivalingaiah, R. Shringarpure, S. Uppili, S. Venugopal, and B. Vogt, "Degradation effects in a-Si:H thin film transistors and their impact on circuit performance," IEEE Trans. Elec. Dev., vol. 56, no. 6, pp. 1166-1176, June 2009.



Douglas Cochran

Associate Professor, PhD, Harvard University
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Research Expertise: Sensor signal processing, applied harmonic analysis, detection theory.

Douglas Cochran joined the ASU faculty in 1989. Between 2000 and 2005 and again from 2008 through 2010, he was on assignment to program management positions in federal agencies, first at the U.S. Defense Advanced Research Projects Agency and subsequently at the U.S. Air Force Office of Scientific Research. He served as Assistant Dean for Research in the Ira A. Fulton School of Engineering between 2005 and 2008. Before coming to ASU, he was a senior scientist at BBN Laboratories. Professor Cochran has served as a visiting scientist at the Australian Defense Science and Technology Organisation, as associate editor of the IEEE Transactions on Signal Processing, and as general co-chair for the 1999 IEEE International Conference on Acoustics, Speech, and Signal Processing and the 1997 U.S.-Australia Workshop on Defense Signal Processing. He holds PhD and SM degrees in applied mathematics from Harvard University and degrees in mathematics from UCSD and MIT.

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

Selected Recent Publications:

C. P. S. Thejaswi, A. Bennatan, J. Zhang, A. R. Calderbank, and D. Cochran, "Cooperative relaying with layered coding for two-hop interference flows," IEEE Transactions on Information Theory, vol. 57, no. 5, pp. 2765-2780, May 2011.

P. Mahanti, T. Taylor, M. Hayes, D. Cochran, and M. Petkus, "Improved detectability and signal strength for rotating phase fluorescence immunoassays through image processing," Analyst, vol. 136, no. 2, pp. 365-373, Jan. 2011.

I. V. L. Clarkson, S. D. Howard, W. Moran, D. Cochran, and M. L. Dawson, "Maximum-likelihood and best invariant orientation estimation," Proceedings of the 44th Asilomar Conference on Signals, Systems, and Computers, Pacific Grove CA, November 2010.

A. Viswanathan, A. Gelb, D. Cochran, and R. Renaut, "On reconstruction from non-uniform spectral data," Journal of Scientific Computing, vol. 45, no. 1, pp. 487-513, October 2010.



Rodolfo Diaz

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Research Expertise: Optical scattering of sub-wavelength objects in complex environments and nanophotonics, analytic theory of natural and artificial media, measurement of electromagnetic properties of materials, combined computational mechanics and electromagnetics.

During his 20 years in the aerospace industry, Professor Diaz has worked on many aspects of the interaction between electromagnetic waves and materials, from lightning protection on the space shuttle through the design of microwave lenses and high-temperature broadband radomes for radar missiles to the design and manufacture of radar-absorbing structures for Stealth applications. He joined the ASU faculty in 1998 and currently is an associate professor of electrical engineering. Professor Diaz is the former associate director of the Consortium for Metrology of Semiconductor Nanodefects, interim director of the Consortium for Engineered Materials in the School of Materials at ASU. He also holds 21 patents ranging from the design of broadband radomes to the amplification of magnetic fields.

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:

- Sang-Soo Je, F. Rivas, R. E. Diaz, J. Kwon, J. Kim, B. Bakkaloglu, S. Kiaei, and J. Chae, "A compact and low-cost MEMS loudspeaker for digital hearing aids," *IEEE Trans. Biomed. Circ. Sys.*, vol. 3, no. 5, pp. 348-358, Oct. 2009.
- A. H. Panaretos, and R.E. Diaz, "A simple and accurate methodology to optimize parameter dependent finite-difference time-domain schemes," *IEEE Transactions on Microwave Theory and Techniques*, vol. 56, no. 5, pp. 1125-1136, May 2008.
- A. H. Panaretos, J. T. Aberle, and R. E. Diaz, "The effect of the 2-D Laplacian operator approximation on the performance of finite difference time-domain schemes for Maxwell's equations," *Journal of Computational Physics*, vol. 227, issue 1, pp. 513-536, Nov. 2007.
- A. H. Panaretos, J. T. Aberle, and R. E. Diaz, "A three-dimensional FDTD scheme based on a transversely extended curl operator," *IEEE Transactions on Microwave Theory and Techniques* 54, no. 12, pp. 4237-4246, Dec. 2006.



Tolga M. Duman

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Research Expertise: Digital communications, wireless and mobile communications, channel coding, coded modulation, multi-user communications, information theory, underwater acoustic communications

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

Honors and Distinctions: IEEE Fellow, 2010 NSF CAREER Award, 2000; IEEE Third Millennium Medal; Editor for *IEEE Trans. on Wireless Communications* (2003-2008) and *IEEE Trans. on Communications* (2007-present).

Selected Publications:

- Tolga M. Duman and Ali Ghayeb. *Coding for MIMO Communication Systems*. Wiley, 2007.
- Dario Fertonani, Tolga M. Duman, and M. Fatih Erden, "Bounds on the capacity of channels with insertions, deletions and substitutions," *IEEE Trans. on Communications*, vol. 59, no. 1, pp. 2-6, Jan. 2011.
- Dario Fertonani and Tolga M. Duman, "Novel bounds on the capacity of binary deletion channel," *IEEE Transactions on Information Theory*, vol. 56, no. 6, pp. 2753-2765, June 2010.
- Jun Hu, Tolga M. Duman, M. Fatih Erden, and Aleksandar Kavcic, "Achievable information rates for channels with insertions, deletions and intersymbol interference with i.i.d. inputs," *IEEE Trans. on Communications*, vol. 58, no. 4, pp. 1102-1111, Apr. 2010.
- Ahmet B. Keha and Tolga M. Duman, "Minimum distance computation of LDPC codes using branch and cut algorithm," *IEEE Trans. on Communications*, vol. 58, no. 4, pp. 1072-1079, Apr. 2010.



Richard Farmer

Research Professor, MS, Arizona State University
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Research Expertise: Extra-high voltage (EHV) project planning and interaction of turbine generators with EHV transmission systems

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

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:

- S. R. Puchalapalli, R. G. Farmer, G. G. Karady, J. Hernandez, and Y. Suh, "Z-Bus based frequency scanning program for sub-synchronous resonance screening," *Proceedings of 2007 IEEE Lausanne, Power Tech Conference*, Lausanne, Switzerland.
- R. G. Farmer, B. L. Agrawal, and D. G. Ramey, "Power system dynamic interaction with turbine generators," *Electric Power Engineering Handbook*, Boca Raton, FL: CRC Press, 2007.
- R. G. Farmer and E. H. Allen, "Power system dynamic performance advancement from history of North American blackouts," *Proceedings of the 2006 IEEE PES Power Systems Conference and Exposition*, Oct. 29-Nov. 1, 2006, Atlanta, GA.
- Priyantha Sirisooriya, G. G. Karady, and R. G. Farmer, "A Flow-based approach for evaluating fuel cell interconnections to a distribution feeder," *Proceedings of 2005 IEEE St. Petersburg Power Tech Conference*.
- E. Kyriakides and R. G. Farmer, "Modeling of damping for power system stability analysis," *Electric Power Components and Systems Journal*, vol. 32, no. 8, pp. 827-837, Aug. 2004.



David K. Ferry

Regents' Professor, PhD, University of Texas
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Research Expertise: Transport physics and modeling of quantum effects in submicron semiconductor devices, scanning gate microscopy of quantum properties of mesoscopic devices

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.

Honors and Distinctions: Regents' Professor at ASU; IEEE Cleo Brunetti Award, 1999; Fellow, American Physical Society; Fellow, IEEE; Fellow, 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:

D. K. Ferry, "Feynman on quantum simulation—Rush to judgment," *Journal of Computational and Theoretical Nanoscience* vol. 8, pp. 953-962, 2011.

D. K. Ferry, A. M. Burke, R. Akis, R. Brunner, T. E. Day, R. Meisels, F. Kuchar, J. P. Bird, and B. R. Bennett, "Open quantum dots—probing the quantum to classical transition," *Semiconductor Science and Technology* vol. 26, 043001 (14 pages), 2011.

D. K. Ferry, "Probing Bell's inequality with classical systems," *Fluctuation and Noise Letters*, vol. 9, pp. 395-402, 2010.

D. Guerra, M. Saraniti, N. Faralli, D. K. Ferry, S. M. Goodnick, and F. A. Marino, "Comparison of N- and Ga-Face GaN HEMTs through cellular Monte Carlo simulations," *IEEE Transactions on Electron Devices*, vol. 57, pp. 3348-3354, 2010.



David H. Frakes

Assistant Professor, PhD, Georgia Institute of Technology
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Research Expertise: general - image and video processing, fluid dynamics, machine vision; specific - endovascular treatment of cerebral aneurysms, surgical planning for congenital heart defects, suppression of atmospheric distortion in video, control of flexible systems

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.

Honors and Distinctions: 2011 Arizona State University Top 5% Excellence in Instruction Award; 2011 IEEE Phoenix Section Outstanding Faculty Award; 2010 Rosann Donato Chair of Research – The Brain Aneurysm Foundation; 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:

S. Beeman, M. Zhang, L. Gubhaju, T. Wu, J. Bertram, B. Cherry D. Frakes, and K. Bennett, "Measuring glomerular number and size in perfused kidneys using MRI," *American Journal of Physiology – Renal Physiology*, vol. 300, issue 6, pp. F1454-57, June 2011.

O. Dur, S. Coskun, K. Coskun, D. Frakes, L. Kara, and K. Pekkan, "Computer-aided patient-specific coronary artery graft design improvements using CFD coupled shape optimizer," *Cardiovascular Engineering and Technology*, vol. 2, issue 1, pp. 35-47, Mar. 2011.

M. Patrick, C. Chen, D. Frakes, O. Dur, and K. Pekkan, "Cellular level near-wall unsteadiness of high-hematocrit erythrocyte flow," *Experiments in Fluids*, vol. 50, issue 4, pp. 887-904, July 2010.

K. Sundareswaran, D. Frakes, M. Fogel, D. Soerensen, J. Oshinski, and A. Yoganathan, "Optimum fuzzy filters for phase-contrast magnetic resonance imaging segmentation," *Journal of Magnetic Resonance Imaging*, vol. 29, no. 1, pp. 155-65, Jan. 2009.



Gennady Gildenblat

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Research Expertise: Physics and modeling of semiconductor devices, semiconductor transport physics, integrated circuit technology

Gennady Gildenblat received an MSEE (with honors) from the St. Petersburg Electrical Engineering Institute in 1975 and a 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. Professor Gildenblat has over 150 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, Professor Gildenblat was with The Pennsylvania State University, until in 2006, when he joined Arizona State University. He has developed an advanced surface-potential-based SP and PSP compact MOSFET model. The PSP model (joint development with NXP) was selected as an international industry standard by the Compact Model Council (PSPmodel.asu.edu) in 2006. In 2007, PSP-based compact varactor model (joint development with Jazz semiconductor) became another industry standard.

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

Selected Publications:

G. Gildenblat (Ed). *Compact Modeling – Principles, Techniques and Applications*. Springer, 2010.

Z. Zhu, A. Kathuria, S. G. Krishna, M. Mojarradi, B. Jalali-Farahani, H. Barnaby, W. Wu, and G. Gildenblat, "Design applications of compact MOSFET model for the extended temperature range (60-400K)," *Electronics Letters*, vol. 47, no. 2, pp. 141-142, 2011.

X. Li, C. C. McAndrew, W. Wu, S. Chaudhry, J. Victory, and G. Gildenblat, "Statistical modeling with the PSP MOSFET model," *IEEE Transactions on Computer-aided Design of Integrated Circuits and Systems*, vol. 29, pp. 599-606, 2010.

G. Dessai and G. Gildenblat, "Solution space for the independent-gate asymmetric DGFET," *Solid-State Electronics*, vol. 54, pp. 382-384, 2010.



Stephen Goodnick

Professor, PhD, Colorado State University
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Research Expertise: Solid state device physics, transport in nanostructures, nanoelectronic devices and circuits, computational electronics, RF and microwave devices, optoelectronic and energy conversion devices

Stephen Goodnick is presently the deputy director of the ASU Lightworks initiative. He recently served as the associate vice president for research from 2006-2008, and prior to that as deputy dean of the Fulton Schools of Engineering. 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 is currently the president of the board of governors of the IEEE Eta Kappa Nu engineering honor society and president elect of the IEEE Nanotechnology Council. 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 in 2009. Professor Goodnick has published over 200 refereed journal articles, books and book chapters.

Honors and Distinctions: Fellow, IEEE, 2004; Robert M. Janowiak Outstanding Leadership and Service Award, Electrical and Computer Engineering Department Heads Association, 2008; Alexander von Humboldt Research Fellow, Germany, 1986; College of Engineering Research Award, Oregon State University, 1996; Colorado State University College of Engineering Achievement in Academia Award, 1998; IEEE Phoenix Section Society Award for Outstanding Service, 2002.

Selected Publications:

D. Vasileska, S. M. Goodnick, and G. Klimeck. Computational Electronics: Semi-Classical and Quantum Device Modeling and Simulation. UK: Taylor and Francis (600 pages), 2010.
F. A. Marino, N. Faralli, T. Palacios, D. K. Ferry, S. M. Goodnick, and M. Saraniti, "Effects of threading dislocations on AlGaIn/GaN high-electron mobility transistors," IEEE Transactions on Electron Devices, vol. 57, issue 1, pp. 353-360, 2010.
D. K. Ferry, S. M. Goodnick, and J. Bird, Transport in Nanostructures, 2nd Ed., UK: Cambridge University Press (650 pages), 2009.



Ravi Gorur

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

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

Honors and Distinctions: IEEE Fellow, 1999; U.S. representative to CIGRE Study Committee D1 (materials for advanced technologies); Claude de Tourreil Memorial Award for Lifetime Achievement in the field of electrical insulators, 2011.

Selected Publications:

D. Rodriguez, R. S. Gorur, and P. Hansen, "Effect of humidity on the breakdown characteristics of air in nonuniform fields at 30 kHz," IEEE Transactions on Dielectrics and Electrical Insulation, vol. 17, no. 1, pp. 45-52, 2010.
T. Doshi, R. S. Gorur, and J. Hunt, "Electrical field calculations of composite insulators up to 1200 kV ac," IEEE Transactions on Dielectrics and Electrical Insulation, paper no. 3040, 2011.
G. Iyer, R. S. Gorur, R. Rickert, and A. Krivda, "Performance of epoxy nanocomposites for HV insulation," IEEE Transactions on Dielectrics and Electrical Insulation, paper no. 3050, 2011.
D. Rodriguez, R. S. Gorur, and P. Hansen, "Prediction of breakdown of air for VLF/LF," European Journal of Electric Power, paper no. 117, 2011.
J. Han, R. S. Gorur, and P. Hansen, "Breakdown characteristics of SF6 for VLF/LF," European Journal of Electric Power, paper no. 111, 2011.



Michael Goryll

Assistant Professor, PhD, RWTH Aachen University, Germany
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Research Expertise: Surface and interface physics, new materials in CMOS processing, fabrication of nanoscale semiconductor devices, transport phenomena in nanopores, integration of biomaterialized structures with silicon MEMS, electrophysiological properties of cell membrane ion channels, low-noise analog amplifier design, electronic instrumentation for biophysical measurements

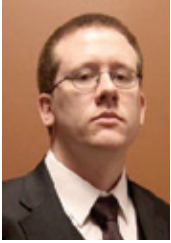
Michael Goryll joined the faculty in 2007. He received a PhD in physics in 2000 and a Diplom in physics in 1997, both from the RWTH Aachen University, Germany. He performed his post-doctoral research on biosensors at ASU during the years 2003-2005. Before joining ASU, Professor Goryll spent several years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

Honors and Distinctions:

2010 Top 5% Faculty Teaching Award in Engineering at ASU; Helmholtz Research Fellowship for Outstanding Young Investigators granted by the Research Centre Juelich, Germany (2001-2005); Post-Graduate Scholarship granted by the RWTH Aachen University, Germany (1997-2000).

Selected Publications:

S. Choi, M. Goryll, L. Y. M. Sin, P. K. Wong, and J. Chae, "Microfluidic-based biosensors toward point-of-care detection of nucleic acids and proteins," Microfluidics and Nanofluidics, vol. 10, pp. 231-247, 2011.
P. Joshi, A. Smolyanitsky, L. Petrossian, M. Goryll, M. Saraniti, and T. J. Thornton, "Field effect modulation of ionic conductance of cylindrical silicon-on-insulator nanopore array," Journal of Applied Physics, vol. 107, 054701-1-6, 2010.
F. Lanzerath, D. Buca, H. Trinkaus, M. Goryll, S. Mantl, J. Knoch, U. Breuer, W. Skorupa, and B. Ghysselen, "Boron activation and diffusion in silicon and strained silicon-on-insulator by rapid thermal and flash lamp annealings," Journal of Applied Physics, vol. 104, issue 4, 044908-1-7, 2008.
S. J. Wilk, L. Petrossian, M. Goryll, T. J. Thornton, S. M. Goodnick, J. M. Tang, and R. S. Eisenberg, "Integrated electrodes on a silicon based ion channel measurement platform," Biosensors & Bioelectronics, vol. 23, issue 2, pp. 183-190, 2007.



Kory W. Hedman

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Research Expertise: Power and energy systems, operations research, renewable energy, power system economics, operations and planning, transmission engineering, mathematical programming, stochastic optimization, market design, financial engineering

Kory W. Hedman received the BS degree in electrical engineering and the BS degree in economics from the University of Washington, Seattle, in 2004, and the MS degree in economics and the MS degree in electrical engineering from Iowa State University, Ames, in 2006 and 2007, respectively. He received the MS and PhD degrees in industrial engineering and operations research from the University of California, Berkeley in 2007 and 2010, respectively. He has worked for the California ISO (CAISO) in Folsom, CA, on transmission planning, as well as for the Federal Energy Regulatory Commission (FERC), Washington, DC, on transmission switching. Hedman joined the School of Electrical, Computer, and Energy Engineering at Arizona State University as an assistant professor in 2010. He is also listed as a graduate faculty in ASU's department of industrial engineering. Professor Hedman's research at ASU includes pricing mechanisms for the electric distribution system, improving calculation of reserve requirements, stochastic unit commitment models that incorporate intermittent (wind and solar) resources, and creating a robust corrective switching model for improved system reliability. Professor Hedman is a member of the Power System Engineering Research Center (PSERC).

Selected Publications:

- K. W. Hedman, S. S. Oren, and R. P. O'Neill, "Optimal transmission switching: Economic efficiency and market implications," *Journal of Regulatory Economics*, accepted for publication.
- K. W. Hedman, S. S. Oren, and R. P. O'Neill, "A review of transmission switching and network topology optimization," *IEEE PES General Meeting 2011*, Detroit, MI, 2011.
- K. W. Hedman, R. P. O'Neill, E. B. Fisher, and S. S. Oren, "Smart flexible just-in-time transmission and flowgate bidding," *IEEE Transactions on Power Systems*, vol. 26, no. 1, pp. 93-102, Feb. 2011.
- R. P. O'Neill, K. W. Hedman, E. A. Krall, A. Papavasiliou, and S. S. Oren, "Economic analysis of the ISOs multi-period N-1 reliable unit commitment and transmission switching problem using duality concepts," *Energy Systems Journal*, vol. 1, no. 2, pp. 165-195, 2010.



Gerald T. Heydt

Regents' Professor, PhD, Purdue University
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Research Expertise: Power engineering, electric power quality, distribution engineering, transmission engineering, computer applications in power engineering, power engineering education, power system sensors and instrumentation.

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

Honors and Distinctions: Fellow, IEEE; Member, U.S. National Academy of Engineering; Edison Electric Institute Power Engineering Educator Award, 1989; IEEE Power Engineering Society Power Engineering Educator of the Year, 1995; IEEE Kaufmann Award, 2010.

Selected Publications:

- Alex Q. Huang, Mariesa L. Crow, Gerald Thomas Heydt, Jim P. Zheng, Steiner J. Dale, "The future renewable electric energy delivery and management (FREEDM) system: The energy Internet," *Proceedings of the IEEE*, vol. 99, no. 1, pp. 133-148, Jan. 2011.
- G. Heydt, "The next generation of power distribution systems," *IEEE Transactions on Smart Grid*, vol. 1, no. 3, pp. 225-235, Dec. 2010.
- K. Munukutla, V. Vittal, G. Heydt, D. Chipman, and B. Keel, "A practical evaluation of surge arrester placement for transmission line lightning protection," *IEEE Transactions on Power Delivery*, vol. 25, no. 3, pp. 1742-1748, July 2010.



Keith Holbert

Associate Professor, PhD, University of Tennessee
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Research Expertise: Process monitoring and diagnostics, sensor fault detection, instrumentation development, fuzzy logic, spacecraft charging, and radiation effects on electronics.

Keith Holbert is the director of the nuclear power generation program. He joined the faculty in 1989. Professor Holbert is a registered professional (nuclear) engineer and has published over 100 refereed journal and conference papers.

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; IEEE Transactions on Education Best Paper award, 2010; Guest Scientist, Los Alamos National Laboratory, 2005-2011.

Selected Publications:

- K. Lin and K. E. Holbert, "Void diagnostics in liquid-filled pressure sensing lines," *Progress in Nuclear Energy*, vol. 52, no. 5, pp. 503-511, July 2010.
- K. E. Holbert, G. G. Karady, S. G. Adhikari, and M. L. Dyer, "Magnetic fields produced by underground residential distribution system," *IEEE Transactions on Power Delivery*, vol. 24, no. 3, pp. 1616-1622, July 2009.
- K. Lin and K. E. Holbert, "Applying the equivalent Pi circuit to the modeling of hydraulic pressurized lines," *Mathematics and Computers in Simulation*, vol. 79, no. 7, pp. 2064-2075, Mar. 2009.
- K. E. Holbert and G. G. Karady, "Strategies, challenges and prospects for active learning in the computer-based classroom," *IEEE Transactions on Education*, vol. 52, no. 1, pp. 31-38, Feb. 2009.
- K. Lin and K. E. Holbert, "Blockage diagnostics for nuclear power plant pressure transmitter sensing lines," *Nuclear Engineering and Design*, vol. 239, no. 2, pp. 365-372, Feb. 2009.
- K. E. Holbert, A. S. Heger, D. M. Geschke, R. M. Stewart, "Prediction of Corning InfiniCor 300 optical fiber attenuation at low gamma dose rates," *IEEE Transactions on Nuclear Science*, vol. 55, no. 6, pp. 3515-3522, Dec. 2008.



Christiana Honsberg

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

Professor Christiana Honsberg joined the electrical engineering faculty in 2008 and is currently a professor. 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.

Selected Publications:

S. P. Bremner, M. Y. Levy, and C. B. Honsberg, "Limiting efficient of an intermediate band solar Cell Under a Terrestrial Spectrum," *Applied Physics Lett.*, February 2008.

S. P. Bremner, G. M. Liu, N. Faleev, K. Gosh, and C. B. Honsberg, "Growth and characterization of GaAs_{1-x}Sb_x barrier layers for advanced concept solar cells," *Journal of Vacuum Science and Technology B*, 2008.

C. B. Honsberg, and M. Y. Levy, "Nanostructured absorbers for multiple transition solar cells," *IEEE Transaction on Electron Devices*, vol. 56, no. 3, 706-711, 2008.

S. P. Bremner, M. Y. Levy, and C. B. Honsberg, "Analysis of tandem solar cell efficiencies under AM 1.5G spectrum using a rapid flux calculation method," *Progress in Photovoltaics: Research and Application*, available online, February 2008.

O. Jani, I. Ferguson, C. B. Honsberg, and S. Kurtz, "Design and characterization of GaN/ InGaN solar cells," *Applied Physics Lett.*, vol. 91, no. 13, 1-3, 2007.

N. Fleeve, C. B. Honsberg, O. Jani, and I. Ferguson, "Crystalline perfection of GaN and AlN epitaxial layer and the main Features of Structural Transformation of Crystalline Defects," *Journal of Crystal Growth*, vol. 300, 1400-1405, 2006.

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

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



Joseph Hui

ISS Chair Professor, PhD, Massachusetts Institute of Technology
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Research Expertise: Wireless networks, broadband switching and routing, teletraffic analysis, coding and information theory, virtualization and cloud computing, renewable energy

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.

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:

Joseph Y. Hui and David A. Daniel, "Terabit Ethernet: Access and core switching using time-space carrier sensing," *IEEE Systems Journal*, vol. 4 issue 4, pp. 458-466, Dec. 2010.

Joseph Y. Hui and Lingjie Li, "First-fit scheduling for multi-stage packet switching networks," *Journal of Communications, Academic Publishers*, vol. 5, no. 3, pp. 205-210, Mar. 2010.

J. Hui, and D. Daniel, "Terabit Ethernet: A time-space carrier sense multiple access method," *Proceedings of the 2008 IEEE Globecom*, 1-6, 2008.

J. Hui, and L. Li, "First-fit scheduling for multistage packet switching networks," in *Proceedings of 2008 High Performance Switching and Routing Symposium*, 197-202, (also published as journal paper in 2008).

J. Hui, and D. Daniel, "Virtualization of local computer bus architectures over the Internet," *IEEE Globecom 2007 Internet Protocol Symposium*, Nov. 2007.

J. Hui and P. C. Gurumohan, "Selfish vs. social routing with competitive traffic pricing," in *Proceeding of 43rd Annual Allerton Conference on Communication, Control, and Computing*, 341-345, Sep. 2005.

J. Hui, S. B. Narasimhamurthy, P. C. Gurumohan, and S. Sreenivasamurthy, "Quanta data storage: An information processing and transportation architecture for storage area networks," *IEEE Journal on Selected Areas in Communications*, vol. 23, issue 10, pp. 2032-2040, Oct. 2005.



Bahar Jalali-Farahani

Assistant Professor, PhD, Ohio State University
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Research Expertise: 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 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.

Selected Publications:

B. Jalali Farahani and A. Meruva, "A 14-b 32MS/s pipelined ADC with fast convergence comprehensive background calibration," *Journal of Analog Integrated Circuits and Signal Processing*, vol. 61, no. 1, pp. 65-74, Oct. 2009.

A. Meruva and B. Jalali-Farahani, "A 14-b 32MS/s pipelined ADC with fast convergence comprehensive background calibration," *International Symposium on Circuits and Systems*, September 2009.

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

S. Thirunakkarasu A.I. Hossain and B.J. Farahani, "Sigma Delta Modulators with Modified Hybrid Integrators," *Midwest Symposium on Circuits and Systems*, 642-645, August 2008. F. Ge and B. Jalali-Farahani, "A Versatile Chopper-Stabilized Rail-to-Rail Operational Amplifier," *Midwest Symposium on Circuits and Systems*, 113-116, August 2008.

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

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



George G. Karady

Professor, PhD, University of Technical Sciences, Budapest
karady@asu.edu; (480) 965-6569

Research Expertise: Power electronics, high-voltage engineering and power systems

George G. Karady received his MS and PhD degrees in electrical engineering from the Technical University of Budapest. He was appointed 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 an electrical task supervisor for the Tokamak Fusion Test Reactor project in Princeton. Professor Karady has graduated 21 PhD and 43 MS students. He is an IEEE Fellow, and has published a book, several book chapters, and more than 128 journal and 199 conference papers.

Honors and Distinctions: Fellow of IEEE; 2010 Best Transaction Paper Award (with K. Holbert); Chair, Awards Committee, IEEE PES Chapter and membership division, 2000-2005; President, IEEE Phoenix Section, 2004; Honorary doctorate, Technical University of Budapest, 1999; IEEE Third Millennium Medal; IEEE PES Working Group (WG) Recognition Award, 2002; Chair, WG that prepared IEEE Standard 1313-2.

Selected Publications:

B. L. Kokanos and G. G. Karady, "Associate Hermite expansion small signal mode estimation." *Transaction on Power Systems*; vol. 25, no 2, pp. 999-1007, May 2010.

Sadik Kucuksari and George. G. Karady, "Experimental comparison of conventional and optical current transformers," *IEEE Transaction on Power Delivery*, vol. 25, no. 4, pp. 2455-2463, Oct. 2010.

K. E. Holbert and G. G. Karady, "Strategies, challenges and prospects for active learning in the computer based classroom," *IEEE Transaction on Education*, vol. 52, no. 1, pp. 31-38, Feb. 2009. (Best Transaction Paper Award).

M. Argin and G. G. Karady, "Characterization of polyurethane dielectric strength," *IEEE Transactions on Dielectrics and Electrical Insulation*, vol. 15, issue 2, pp. 350-356, Apr. 2008.



Lina Karam

Professor, PhD, Georgia Institute of Technology
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Research Expertise: Image and video processing, compression, and transmission, visual quality assessment, human visual perception, multidimensional signal processing, digital filtering, source coding, and bio-medical imaging

Lina J. Karam received a BA in engineering from the American University of Beirut in 1989, and 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 (IVU) Lab and the Multi-Dimensional DSP and the Real-Time Embedded Signal Processing Labs at ASU. Professor Karam is a recipient of the National Science Foundation CAREER Award and a NASA Technical Innovation Award. She served as 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 the general chair (together with Ron Schafer) of the 2011 IEEE DSP/SPE Workshops. Professor Karam serves on the editorial boards of several journals and as an elected member of several IEEE Technical Committees.

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 of the Institute of Electrical and Electronics Engineers (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:

Wei-Jung Chien & Lina J. Karam, "BLAST-DVC: BitPLane Selective Distributed Video Coding," *Springer Multimedia Tools and Applications Journal*, Special Issue on Distributed Video Coding, pp. 437-456, 2010.

Asaad F. Said, Bonnie L. Bennett, Lina J. Karam, and Jeff Pettianto, "Robust automated void detection in solder balls and joints," *OnBoard Technology Magazine*, Issue of the Decade on Quality, pp. 36-41, Sep. 2010.



Sayfe Kiaei

Associate Dean for Research; Director, Connection One: NSF/IUCRC
Motorola Chair Professor, PhD, Washington State University
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Research Expertise: RF, analog and digital IC, transceiver design, and sensors

Sayfe Kiaei has been with ASU since January 2001. From 1993 to 2001, he was a senior member of the technical staff with the Wireless Technology Center and Broadband Operations at Motorola where he was responsible for the development of RF & transceiver integrated circuits, GPS RF IC, and digital subscriber line (DSL) transceivers. He was a professor at Oregon State University from 1987-1993 where he taught courses and performed research in RF, analog, VLSI, and communication systems. Professor Kiaei has established two industry-university cooperative research centers: Center for the Design of Analog/Digital ICs (CDADIC) where he was a co-director from 1987-1993, and Connection One at ASU. He was the associate dean for research for the Ira Fulton Schools of Engineering from 2009 to 2011. He has published over 200 journal and conference papers and holds several patents. His research projects are funded by DARPA, NSF, DOE, ARL, AFRL, and a large number of industrial sponsors. He is a member of IEEE Circuits and Systems Society, IEEE Solid State Circuits Society, and IEEE Communication Society. He was the founding member and chair of the RFIC symposium, and has been a chair/technical program chair, and technical program committee member of many conferences, including RFIC, MTT, ISCAS, and other international conferences.

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).

Selected Publications:

T. Copani, Seungkee Min, S. Shashidharan, S. Chakraborty, M. Stevens, S. Kiaei, B. Bakkaloglu, "A CMOS low-power transceiver with reconfigurable antenna interface for medical implant applications," *IEEE Transactions on Microwave Theory and Techniques*, vol. 59, no. 5, pp. 1369-1378, May 2011.



Michael N. Kozicki

Professor, PhD, University of Edinburgh;
Director, Center for Applied Nanoionics
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Research Expertise: Integrated/solid-state nanoionics, low-energy non-volatile memory, self-healing electrodes and interconnect, and nano-electromechanical systems (NEMS)

Michael Kozicki joined ASU in 1985 from Hughes Microelectronics. He 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. Professor Kozicki holds several dozen key patents in programmable metallization cell technology, in which solid electrolytes are used for storage and control of information and for the manipulation of mass at the nanoscale. He has published extensively, developed undergraduate and graduate courses in solid state electronics and is a frequent invited speaker at international meetings. He is also a founder of Axon Technologies, an ASU spin-off company involved in the development and licensing of solid-state ionic technologies, visiting professor at the University of Edinburgh in the United Kingdom, and adjunct professor at GIST in Korea.

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

Selected Publications:

N. Derhacopian, S. C. Hollmer, N. Gilbert, and M. N. Kozicki, "Power and energy perspectives of nonvolatile memory technologies," *Proc. IEEE*, vol. 98, pp. 283-298, 2010.

S. Puthen Thermadam, S. K. Bhagat, T. L. Alford, Y. Sakaguchi, M. N. Kozicki, and M. Mitkova, "Influence of Cu diffusion conditions on the switching of Cu-SiO₂-based resistive memory devices," *Thin Solid Films*, vol. 518, pp. 3293-3298, 2010.



Ying-Cheng Lai

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Research Expertise: Nonlinear dynamics, complex networks, quantum transport in nanostructures, graphene physics, signal processing, and biological physics

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 320 papers, including over 290 published in refereed journals. In the past five years, he gave about 50 invited talks worldwide.

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:

Q.-F. Chen, L. Huang, Y.-C. Lai, C. Grebogi, and D. Dietz, "Extensively chaotic motions in electrostatically-driven nanowires and applications," *Nano Letters*, vol. 10, pp. 406-413, 2010.

J. Ren, W.-X. Wang, B. Li, and Y.-C. Lai, "Noise bridges dynamical correlation and topology in coupled oscillator networks," *Physical Review Letters*, vol. 104, 058701 (2010).

W.-X. Wang, R. Yang, Y.-C. Lai, V. Kovanis, and C. Grebogi, "Predicting catastrophes in nonlinear dynamical systems by compressive sensing," *Physical Review Letters*, vol. 106, 154101-2011.

R. Yang, L. Huang, Y.-C. Lai, and C. Grebogi, "Quantum chaotic scattering in graphene systems," *Europhysics Letters*, vol. 94, 40004(1-5), 2011.

Y.-C. Lai and T. Tel, *Transient Chaos* (Research monograph, 500 pages, Springer, 2011).



Deirdre R. Meldrum

Professor, PhD, Stanford University
Senior Scientist and Director, Center for Biosignatures Discovery Automation,
ASU Biodesign Institute
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Research Expertise: Automation in life sciences, automation, micro- and nano technologies, microscale systems, lab-on-a-chip, single cell, genomics, ecogenomics, robotics, control systems

Deirdre Meldrum joined the ASU faculty in 2007 as dean of engineering, director of the Center for Ecogenomics in the Biodesign Institute at Arizona State University, and professor of electrical engineering. Currently, she is the director for the Center for Biosignatures Discovery Automation at the Biodesign Institute at Arizona State University. Prior to ASU, she was a professor of electrical engineering at the University of Washington where she founded and directed the UW's Genomation Laboratory. Dr. Meldrum is PI, director of the NIH Center of Excellence in Genomic Sciences, Microscale Life Sciences Center funded for \$36 million, August 2001-July 2011. She is an editor for the IEEE Transactions on Automation Science & Engineering, and was general chair for IEEE's Conference on Automation Science & Engineering 2007 and BioRobotics Conference in 2008.

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

Selected Publications:

S. Bhushan, M. Holl, D. Meldrum, T. Ray and H. Zhu, "Characterization of deep wet-etching of fused silica glass for single cell and optical sensor deposition," *Journal of Micromachining and Mechanics*, 19, 065013, 2009.

V. Pizziconi, D. Meldrum, S. Haag, T. Ganesh, L. Cozort, L. Krause, A. Tasooji, A. Valadez, Y. Yarbrough, B. Lunt, and B. L. Ramakrishna, "The P3E2 project: The introduction, implementation, and evaluation of engineering design integrated across the middle school curriculum," *Proceedings of the ASEE Annual Conference and Exposition*, Louisville, KY, June 2010.



Cun-Zheng Ning

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Research Expertise: Nanophotonics, nanowires, surface plasmons and nanolasers, nanomaterials detectors and solar cells, modeling and simulation of optoelectronic devices, quantum optics and two-photon lasers, geometric phases, stochastic resonances

Cun-Zheng Ning joined ASU in 2006 as a 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, 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 in 2006 and a research assistant professor at University of Arizona. Professor Ning has published 140 papers and given over 110 invited, plenary, or colloquium talks. He holds three U.S. patents with two pending. He was an associate editor of IEEE Journal of Quantum Electronics (2001-2003) and a guest editor of several special issues of IEEE and OSA journals. He has served as chair or a committee member of several IEEE and OSA conferences.

Honors and Distinctions: CSC Technical Excellence Award 2003; CSC Civil Group Presidential Award 2001; MRJ Award for Technical Achievement 2000; NASA Group Achievement Award 1999; NASA Space Act Patent Award, 2005, 2007; IEEE/LEOS Distinguished Lecturer Award, 2007-2009.

Selected Publications:

Debin Li and C. Z. Ning, "All-semiconductor active plasmonic system in mid-infrared wavelengths," *Optics Express*, vol. 19, no. 15, pp. 14594-14603, 2011.

Kang Ding, Zhicheng Liu, Leijun Yin, Hua Wang, Ruibin Liu, Martin T. Hill, Milan J. H. Marell, Peter J. van Veldhoven, Richard Nötzel, and C. Z. Ning, "Electrical injection, continuous wave operation of subwavelength-metallic cavity lasers at 260 K," *Appl. Phys. Lett.*, 98, 231108, 2011.

D. A. Caselli and C. Z. Ning, "High-performance laterally-arranged multiple-bandgap solar cells using spatially composition-graded CdxPb1-xS nanowires on a single substrate: A design study," *Optics Express*, vol. 19, no. S4, pp. A686-A694, 2011.

Hua Wang, Minghua Sun, Kang Ding, Martin T. Hill, and Cun-Zheng Ning, "A top-down approach to fabrication of high quality vertical heterostructure nanowire arrays," *Nano Letters*, vol. 11, pp. 1646-1650, 2011



Sule Ozev

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Research Expertise: 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

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.

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 TTTC Naveena Nagi Award, 2002; IBM Corporation Co-operative Fellowship Award, 2000-2002; UCSD Flaviu Cristian Research Award, 1999-2001.

Selected Publications:

E. Acar and S. Ozev, "Low cost MIMO testing for RF integrated circuits," *IEEE Transactions on VLSI Systems*, vol. 18, issue 9, pp. 1348-1356, Sep. 2010.

E. S. Erdogan and S. Ozev, "Detailed characterization of transceiver parameters through loop-back-based BiST," *IEEE Transactions on VLSI Systems*, vol. 18, issue 6, pp. 901-911, June 2010.

E. Acar, S. Ozev, "Low-cost characterization and calibration of RF integrated circuits through I-Q data analysis," *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems*, vol. 28, issue 7, pp. 993-1005, July 2009.

E. Yilmaz and S. Ozev, "Accurate multi-specification DPPM estimation using layered sampling based simulation," *IEEE International Symposium on Quality Electronic Design*, 2010.



Joseph Palais

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Research Expertise: Fiber optic communications, holography, and distance education

Joseph Palais joined the faculty in 1964 and is the electrical engineering graduate program chair. He is also the academic director for the 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.

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:

J. Palais, "Micro-optics-based components for networking," (Chapter 18) in *Optical Society of America Handbook of Optics*, 3rd ed., vol. 5, M. Bass, Ed., New York: McGraw-Hill, 2010.

G. Heydt, K. Nigim, and J. Palais, "E-learning opportunities for electric power engineers," *IEEE Transactions on Power Systems*, vol. 19, no. 3, pp. 1382-1383, Aug. 2007.

J. Palais, "Long distance fiber optic communications," Section 3.2 in *The Electrical Engineering Handbook (Broadcasting and Optical Communication Technology)*, 3rd ed., R. C. Dorf, Ed., RC Press and IEEE Press, 2006.

J. Palais, *Fiber Optic Communications*, 5th ed., Upper Saddle River: Prentice-Hall, 2005. Translations: Korean, Chinese, Persian, Japanese and Syrian.



George Pan

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

George Pan joined the ASU faculty in 1995 as a professor and the director of the Electronic Packaging Laboratory. He has written three book chapters, published 63 research articles in refereed journals and presented 106 papers at national/international conferences. He has offered short courses on wavelets in electromagnetics at Moscow State University, the University of Canterbury, CSIRO in Sydney, IEEE Microwave Symposium, Peking University, the Chinese Aerospace Institute, the 13th Electric Performance of Electronic Packaging (EPEP), Beijing, and the University of Aeronautics and Astronautics and National Central University of ROC. His book *Wavelets in Electromagnetics and Device Modeling* (©2003), was among John Wiley's best-selling titles. He is an associate editor of the IEEE Transactions on Antennas and Propagation, and associate editor of the International Journal of Computational Electronics.

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

Selected Publications:

Z. Huang, G. Pan and H. Pan, "Perfect plane injection for Crank-Nicholson time-domain method," IET Microwave Antennas Propagation, vol. 4, issue 11, pp. 1855-1862, Nov. 2010.

Z. Guo and G. Pan, "On simplified fast modal analysis for through silicon vias in layered media based upon full-wave solutions," IEEE Transactions on Advanced Packaging, vol. 33, no. 2, pp. 517-523, May 2010.

Z. Guo, G. Pan, S. Hall, and C. Pan, "Broadband characterization of complex permittivity for low-loss dielectrics: Circular disk approach," IEEE Transactions on Antennas and Propagation, vol. 57, no. 10, pp. 3126-3135, Oct. 2009.

Z. Huang and G. Pan, "Universally applicable uniaxial perfect matched layer formulation for explicit and implicit FDTD algorithms," IET Microwave Antennas Propag., vol. 2, no. 7, pp. 668-676, July 2008.



Antonia Papandreou-Suppappola

Professor, PhD, University of Rhode Island
papandreou@asu.edu; (480) 965-7881

Research Expertise: Waveform-agile sensing, time-frequency signal and system processing, stochastic processing, radar processing, biological and biomedical signal processing

Antonia Papandreou-Suppappola joined the ASU faculty as an assistant professor in 1999 and was promoted to associate professor in 2004 and professor in 2008. She is currently a member-at-large of the IEEE Signal Processing Society Board of Governors (2010-2012). She was the technical area chair for array processing and statistical signal processing of the 2010 Asilomar Conference on Signals, Systems, and Computers; 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; guest editor for the January 2009 special issue on Waveform-Agile Sensing and Processing for the IEEE Signal Processing Magazine; 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).

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

Selected Publications:

L. Ravichandran, A. Papandreou-Suppappola, Z. Lacroix, A. Spanias, and C. Legendre, "Waveform mapping and time-frequency processing of DNA and protein sequences," IEEE Transactions on Signal Processing, issue 99, 2011.

N. F. Josso, J. J. Zhang, A. Papandreou-Suppappola, C. Ioanna, and T. M. Duman, "Nonstationary system analysis methods for underwater communications," EURASIP Journal on Advances in Signal Processing, Special Issue on: Recent Advances in Theory and Methods for Nonstationary Signal Analysis, 2011.

L. Miao, J. J. Zhang, C. Chakrabarti, A. Papandreou-Suppappola, "Algorithm and parallel implementation of particle filtering and its use in waveform-agile sensing," Journal of Signal Processing Systems, Dec. 2011.



Stephen M. Phillips

Professor and Director of the School, PhD, Stanford University
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Research Expertise: 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

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 appointed electrical engineering department chair in 2005 and director of the School of Electrical, Computer and Energy Engineering in 2009. He has held visiting positions at the NASA Glenn Research Center and the University of Washington. He has served as a program evaluator and is a professional engineer registered in the state of Ohio.

Selected Publications:

Karthikeyan Ramamurthy, Jayaraman Thiagarajan, Prasanna Sattigeri, Michael Goryll, Andreas Spanias, Trevor Thornton, and Stephen Phillips, "Transform domain features for ion-channel signal classification," Journal of Biomedical Signal Processing and Control, 2011.

Narendra V. Lakamraju, Sameer M. Venugopal, David R. Allee, Stephen M. Phillips, and Barry P. O'Brien, "Flexible shock sensor tag with integrated display," Army Science Conference, Orlando, FL, Dec., 2010.

Narendra V. Lakamraju, Sameer M. Venugopal, David R. Allee, Stephen M. Phillips, "Shock wave pressure sensor on PEN substrate," IEEE Sensors Conference, Hawaii, Nov. 2010.

A. T. Al-Hammouri, V. Liberatore, M. S. Branicky, and S. M. Phillips, "Complete stability region characterization for PI-AQM," SIGBED Review, vol. 3, no. 2, pp. 1-6, Apr. 2006.

B. Mi, H. Kahn, F. Merat, A. H. Heuer, D. A. Smith, and S. M. Phillips, "Static and electrically actuated shaped MEMS mirrors," Journal of Microelectromechanical Systems, vol. 14, no. 1, pp. 29-36, 2005.



Martin Reisslein

Associate Professor, PhD, University of Pennsylvania
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Research Expertise: Multimedia streaming, multimedia traffic characteristics, metro and access fiber/wireless networks, and engineering education

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 90 journal articles. He has a Google Scholar h-index of 28 and a Web of Science h-index of 13. He serves as the associate editor for the IEEE/ACM Transactions on Networking and the Computer Networks Journal.

Honors and Distinctions:

NSF CAREER Award, 2002; Editor-in-chief, IEEE Communications Surveys and Tutorials, 2002-2007; ACM Senior Member, ASEE Member, IEEE Senior Member, Informa Member, SPIE Member; IEEE Communication Society 2009 Best Tutorial Paper Award.

Selected Publications:

S. Rein and M. Reisslein, "Performance evaluation of the fractional wavelet filter: A low-memory image wavelet transform for multimedia sensor networks," *Ad Hoc Networks*, vol. 9, no. 4, pp. 482-496, June 2011.

S. Rein and M. Reisslein, "Low-memory wavelet transforms for wireless sensor networks: A tutorial," *IEEE Communications Surveys and Tutorials*, vol. 13, no. 2, pp. 291-307, Second Quarter 2011.

F. Aurzada, M. Scheutzow, M. Reisslein, N. Ghazisaidi, and M. Maier, "Capacity and delay analysis of next-generation passive optical networks (NG-PONs)," *IEEE Trans. on Communications*, vol. 59, no. 5, pp. 1378-1388, May 2011.

R. Moreno, G. Ozogul, and M. Reisslein, "Teaching with concrete and abstract visual representations: Effects on students' problem solving, problem representations, and learning perceptions," *APA Journal of Educational Psychology*, vol. 103, no. 1, pp. 32-47, Feb. 2011.

S. K. Srinivasan, J. Vahabzadeh-Hagh, and M. Reisslein, "The effects of priority levels and buffering on the statistical multiplexing of single-layer H.264/AVC and SVC encoded video streams," *IEEE Trans. on Broadcasting*, vol. 56, no. 3, pp. 281-287, Sep. 2010.



Armando A. Rodriguez

Professor, PhD, Massachusetts Institute of Technology
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Research Expertise: 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) 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, (hypersonic) aerospace, robotic, and low power electronic systems.

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 195 technical papers in refereed journals and conference proceedings. He has authored three engineering texts. Professor Rodriguez has given over 65 invited presentations - 13 plenary - 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 by the Bridge to the Doctorate Program involving 12 NSF fellows.

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; Ralf Yorke Memorial Prize.

Selected Publications:

J. Dickeson, A. A. Rodriguez, S. Sridharan, and A. Korad, "Elevator sizing, placement, and control-relevant tradeoffs for hypersonic vehicles," *AIAA-2010-8339*, *AIAA Guidance, Navigation, and Control Conference*, Toronto, Canada, Aug. 2-5, 2010.

O. Cifdaloz, A. Regmi, J. Anderies, and A. A. Rodriguez, "Robustness, vulnerability, and adaptive capacity in small-scale social-ecological systems: The Pampa Irrigation System in Nepal," *J. of Ecology and Society*, vol. 15, no. 3, art. 39, 2010. [online] <http://www.ecologyandsociety.org/vol15/iss3/art39/>, 46 pages. (Received Ralf Yorke Memorial Prize.)



Ronald Roedel

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Research Expertise: Semiconductor materials and devices with a special interest in optoelectronic and photovoltaic devices, and engineering pedagogy with a special interest in integrated, cross-disciplinary courses

Ronald Roedel joined the faculty in 1981, but is retiring and changing to emeritus status at the end of the spring 2011 semester. He has always tried to carry out research and teaching activities in equal measure. To that end, he has become involved in curriculum reform issues, active-learning strategies, and technology-enhanced education. In the spring 2011 semester he carried out (with the ample assistance of Engineering lecturers and teaching assistants) the design and delivery of a new freshman level- Introduction to Engineering Design - course. This course (FSE100) has a solar energy emphasis and is targeted to both electrical engineering and mechanical engineering majors. On the research side, he has been involved in semiconductor research for approximately 40 years. When he first came to ASU, he developed a research program in solar cell materials and devices with the encouragement of Dean Charles Backus. When the funding for solar energy diminished, he moved to other areas in semiconductor materials and devices. Now that solar energy has returned to favor, he has been working on developing very low cost silicon solar cells, as well as constructing several courses throughout the curriculum on solar cells and photovoltaic system engineering. He is the author or co-author of 35 publications and has roughly 50 presentations, two book chapters and two patents in the fields of semiconductor characterization and engineering education. As an emeritus faculty member, he plans to work on the public policy side of the solar energy issue.

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

Selected Publications:

R. J. Roedel, D. Evans, and S. M. Goodnick, "ECE Curriculum in 2013 and beyond: Vision for metropolitan public research university," *IEEE Transactions on Education*, vol. 46, issue 508, 2003

K. Gonzalez-Landis, P. Flikkema, V. Johnson, J. Palais, E. Penado, R. J. Roedel, and D. Shunk, "The Arizona Tri-university Master of Engineering Program," *Proceedings of the Frontiers in Education (FIE) Conference*, Boston, MA, November 2002.



Marco Saraniti

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Research Expertise: Computational electronics and biophysics

From 1996 to 1998, Marco Saraniti was a faculty research associate with the electrical engineering department of Arizona State University. He joined the electrical and computer engineering department of the Illinois Institute of Technology, Chicago, in 1998, where he was awarded the tenure in 2004, and was promoted to the rank of full professor in June 2007. He joined the faculty of the School of Electrical, Computer, and Energy Engineering of ASU in August 2007. He is the author and coauthor of four book chapters, four technical reports, and more than 90 publications. His current research focuses mainly on computational electronics applied to the simulation of semiconductor devices and biological structures. His recent scientific work covers the following fields: the development of Monte Carlo and cellular automaton techniques for 2-D and 3-D simulation of semiconductor devices, simulation and engineering of semiconductor devices, and the development of numerical methods for the modeling and simulation of membrane proteins.

Selected Publications:

M. Saraniti, "Artificial cells: Designing biomimetic nanomachines," *Nature Nanotechnology*, no. 3, pp. 647-648, 2008.

A. Smolyanitsky and M. Saraniti, "Silicon nanopores as bioelectronic devices: A simulation study," *Journal of Computational Electronics*, vol. 8, no. 2, pp. 90-97, 2009.

D. Guerra, R. Akis, F. A. Marino, D. K. Ferry, S. M. Goodnick, and M. Saraniti, "Aspect ratio impact on RF and DC performance of state-of-the-art short-channel GaN and InGaAs HEMTs," *IEEE Electron Device Letters*, vol. 31, no. 11, pp. 1217-1219, Nov. 2010.

A. Marino, D. K. Ferry, S. M. Goodnick, and M. Saraniti, "RF and DC characterization of state-of-the-art GaN HEMT devices through cellular Monte Carlo simulations," *Physics Status Solidi*, vol. 7, no. 10, pp. 2445-2449, July 2010.

F. A. Marino, D. Cullen, D. Smith, M. McCartney, and M. Saraniti, "Simulation of polarization charge on AlGaIn/GaN high electron mobility transistors: Comparison to electron holography," *Journal of Applied Physics*, vol. 107, no. 5, p. 054516, Mar. 2010.

P. Joshi, A. Smolyanitsky, L. Petrossian, M. Goryll, M. Saraniti, T. J. Thornton, "Field effect modulation of ionic conductance of cylindrical silicon-on-insulator nanopore array," *Journal of Applied Physics*, vol. 107, no. 5, pp. 054701-054701-6, Mar. 2010.



Dieter K. Schroder

Regents' Professor, PhD, University of Illinois
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Research Expertise: Semiconductor devices, photovoltaics, defects in semiconductors, semiconductor material and device characterization, electrical/lifetime measurements, low-power electronics, device modeling, MOS devices

Dieter Schroder joined the ASU faculty in 1981 after 13 years at the Westinghouse Research Labs. He has published two books, 180 journal articles, 10 book chapters, and 171 conference presentations, edited 11 books, holds five patents, and has graduated 63 MS students and 42 PhD students.

Honors and Distinctions: IEEE Life Fellow; IEEE van der Ziel Award; 2007 ASU Regents' Professor, 2009; Outstanding Graduate Mentor, 2010; Distinguished National Lecturer for the IEEE Electron Device Society, 1993-2007; ASU College of Engineering Teaching Excellence Award, 1989, 1998, 2001, 2006, 2008; National Technical University Outstanding Instructor, 1991-2003; University Continuing Education Association Faculty Service Award, 1997; ASU College of Extended Education Distance Learning Faculty Award, 1998; IEEE Meritorious Achievement Award in Continuing Education Activities, 1998; IEEE Phoenix Section: Outstanding Faculty Member, 2000.

Selected Publications:

G. Ng, D. Vasileska, and D. K. Schroder, "Calculation of the electron Hall mobility and Hall scattering factor in 6H-SiC," *J. Appl. Phys.* pp. 106, 053719 1-6, Sept. 2009.

I. Rapoport, P. Taylor, J. Kearns, and D. K. Schroder, "Two-side surface photovoltage studies for implanted iron diffusion in silicon during rapid thermal anneal," *J. Appl. Phys.* 107, 013518 1-6, Jan. 2010.

K. Park, P. Nayak, and D.K. Schroder, "Role of the substrate during pseudo-MOSFET drain current transients," *Solid-State Electron.* 54, 316-322, Mar. 2010.

S. Bowden, C. Honsberg, and D. Schroder, "Moore's law of photovoltaics," *Future Photovoltaics*, vol. 1, pp. 1-7, May 2010.

M. J. Marinella, D. K. Schroder, G. Chung, M. J. Loboda, T. Isaacs-Smith, and J. R. Williams, "Carrier generation lifetimes in 4H-SiC MOS capacitors," *IEEE Trans. Electron Dev.*, vol. 57, pp. 1910-1923, Aug. 2010.

S. C. Puthentheradam, D. K. Schroder, and M. N. Kozicki, "Inherent diode isolation in programmable metallization cell resistive memory elements," *Appl. Phys. A*, 102, pp. 817-826, Mar. 2011.



Jennie Si

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si@asu.edu; (480) 965-6133

Research Expertise: Learning and Approximate dynamic programming, estimation and filtering of stochastic processes, neural networks, neurophysiological basis for control, cortical neural information processing, and brain machine interface

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

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

Selected Publications:

Chenhui Yang, Byron Olson, and Jennie Si, "A multiscale correlation of wavelet coefficients approach to spike detection," *Neural Computation*, vol. 23, no. 1, pp. 215-250, 2011.

Baohua Li and Jennie Si, "Approximate robust policy iteration using multilayer perceptron neural networks for discounted infinite-horizon Markov decision processes with uncertain stationary transition matrices," *IEEE Trans. on Neural Networks*, vol. 21, no. 28, pp. 1270-1280, 2010.

L. Yang, J. Si, K. Tsakallis, and A. Rodriguez, "Direct heuristic dynamic programming for nonlinear tracking control with filtered tracking error," *IEEE Transactions on Systems, Man, and Cybernetics, Part B*, 2009.

James Dankert, Byron Olson, and Jennie Si, "Asynchronous decision making in a memorized paddle pressing task," *Journal of Neural Engineering*, vol. 5, pp. 363-373, Sep. 2008.

Baohua Li and Jennie Si, "Robust optimality for discounted infinite-horizon Markov decision processes with uncertain transition matrices," *IEEE Transactions on Automatic Control*, vol. 53, no. 9, pp. 2112-2116, Oct. 2008.

Chao Lu, Jennie Si, and Xiaorong Xie, "Direct heuristic dynamic programming method for power system stability enhancement," *IEEE Trans. on Systems, Man, and Cybernetics, Part B*, vol. 38, no. 4, pp. 1008-1013, Aug. 2008.



Brian Skromme

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Research Expertise: 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.

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.

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:

B. J. Skromme, A. Sasikumar, B. M. Green, O. L. Hartin, C. E. Weitzel, and M. G. Miller, "Reduction of low-temperature nonlinearities in pseudomorphic AlGaAs/InGaAs HEMTs due to Si-related DX centers," *IEEE Trans. Electron Devices*, vol. 57, no. 4, pp. 749-754, 2010.

Y. Wang, P. A. Losee, S. Balachandran, I. B. Bhat, T. P. Chow, Y. Wang, B. J. Skromme, J. K. Kim, and E. F. Schubert, "Achieving low sheet resistance from implanted p-type layers in 4H-SiC using high temperature graphite capped annealing," *Mater. Sci. Forum*, vol. 556-557, pp. 567-571, 2007.

Y. Wang, M. K. Mikhov, and B. J. Skromme, "Formation and properties of Schottky diodes on 4H-SiC after high temperature annealing with graphite encapsulation," *Mater. Sci. Forum*, vol. 527-529, pp. 915-918, 2006.

A. Mahajan and B. J. Skromme, "Design and optimization of junction termination extension (JTE) for 4H-SiC high voltage Schottky diodes," *Solid State Electron*, vol. 49, pp. 945-955, 2005.

L. Chen, B. J. Skromme, R. F. Dalmau, R. Schlessler, Z. Sitar, C. Chen, W. Sun, J. Yang, M. A. Khan, M. L. Nakarmi, J. Y. Lin, and H.-X. Jiang, "Band-edge exciton states in AlN single crystals and epitaxial layers," *Appl. Phys. Lett.*, vol. 85, pp. 4334-4336, 2004.



Andreas Spanias

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

Andreas Spanias joined ASU in 1988. He has published more than 58 journal and 175 conference papers and contributed several book chapters. He authored two textbooks in DSP and audio coding and two Morgan-Claypool Lecture Series book monographs. 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 SenSIP Center and Industry Center and NSF I/UCRC, PI of a major multi-university NSF program and Co-PI on the NSF AME IGERT program. He is a book series editor for Morgan-Claypool Lecture Series.

Honors and Distinctions: IEEE Fellow; 2004 IEEE Distinguished Lecturer; IEEE Donald G. Fink Prize for paper "Perceptual Coding of Digital Audio," 2002; Intel Advanced Personal Communications Award, 1997; Intel Research Council: Award, 1996; Intel Award for Leadership & Contributions to the 60172 Architecture, 1993; J-DSP software (jdsp.asu.edu) ranked in Top 3 Educational Resources by 2003 UC-Berkeley NEEDS panel.

Selected Publications:

Wichern, G., Xue Jiachen, H. Thornburg, B. Mechtley, and A. Spanias, "Segmentation, indexing, and retrieval for environmental and natural sounds," *IEEE Transactions on Audio, Speech, and Language Processing*, vol. 18, issue 3, pp. 688-707, 2010.

M. K. Banavar, C. Tepedelenioglu, A. Spanias, "Estimation over fading channels with limited feedback using distributed sensing," *IEEE Transactions on Signal Processing*, vol. 58, issue 1, pp. 414-425, 2010.

K. N. Ramamurthy, J. J. Thiagarajan, P. Sattigeri, M. Goryll, A. Spanias, T. Thornton, S. M. Phillips, "Transform domain features for ion-channel signal classification," *Biomedical Signal Processing and Control Journal*, vol. 6, no. 3, pp. 219-224, 2011.

H. Krishnamoorthi, A. Spanias, and V. Berisha, "A frequency/detector pruning approach for loudness estimation," *IEEE Signal Processing Letters*, vol. 16, no. 11, pp. 997-1000, Dec. 2009.



Nongjian (NJ) Tao

Professor, PhD, Arizona State University
Director, The BioDesign Institute, Bioelectronics and Biosensors
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Research Expertise: Chemical and biological sensors, molecular and nano electronics, mobile health devices, wireless sensors

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 published over 200 refereed journal articles and book chapters, which have been cited ~8500 times. He has given over 200 invited and keynote talks worldwide.

Honors and Distinctions: Fellow, AAAS; Fellow, American Physical Society; Alexander von Humboldt Senior Research Award; Hellmuth Fisher Medal; NSF two-year extension for Special Creativity; Excellence in Research Award, Florida International University; AzTE Innovator of the Year; Molecular Imaging Young Microscopist.

Selected Publications:

I. Diez-Perez, J. Hihath, T. Hines, Z. S. Wang, G. Zhou, K. Müllen, and N. J. Tao, "Controlling single molecule conductance through lateral coupling of π -orbitals," *Nature Nano*, 6, 226-231, 2011.

W. Wang, K. Foley, X. N. Shan, S. P. Wang, S. Eaton, V. J. Nagaraj, P. Wiktor, U. Patel, and N. J. Tao, "Electrochemical impedance microscopy based on plasmonics: A study of single cells and intracellular processes," *Nature Chem.*, 3, 6, pp. 226-231, 2011.

Diez-Perez, Z. H. Li, J. Hihath, J. H. Li, C. Y. Zhang, X. M. Yang, L. Zang, Y. J. Dai, X. L. Feng, K. Muellen, and N. J. Tao, "Gate-controlled electron transport in coronenes: Bottom-up approach towards graphene transistors," *Nature Communication*, 1, 31, 2010.

X. Shan, U. Patel, S. Wang, R. Iglesias, and N. J. Tao, "Imaging local electrochemical current via surface plasmon resonance," *Science*, 327, pp. 1363-1366, 2010.

S. P. Wang, X. N. Shan, U. Patel, X. P. Huang, J. Lu, J. H. and Li, and NJ Tao, "Label-free imaging, detection and mass measurement of single viruses by surface plasmon resonance," *Proc. Natl Acad. Sci.*, 107, pp. 16028-16032, 2010.

J. L. Xia, F. Chen, J. H. Li, and N. J. Tao, "Measurement of quantum capacitance of graphene," *Nature Nano.*, 4, pp. 505-509, 2009.



Cihan Tepedelenioglu

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Research Expertise: Wireless communications, statistical signal processing, data mining for PV systems

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

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

Selected Publications:

K. Bai, and C. Tepedelenioglu, "Distributed detection in UWB wireless sensor networks," *IEEE Trans. on Signal Processing*, vol. 58, no. 2, pp. 804-813, Feb. 2010.

N. He and C. Tepedelenioglu, "Fast and low-complexity synchronization for non-coherent UWB receivers," *IEEE Transactions on Wireless Commun.*, vol. 6, no. 3, pp. 1014-1023, Mar. 2007.

C. Tepedelenioglu, "Maximum multipath diversity with linear equalization in precoded OFDM systems," *IEEE Transactions on Information Theory*, vol. 50, no. 1, pp. 232-235, Jan. 2004.

C. Tepedelenioglu and R. Challagulla, "Low complexity multipath diversity through fractional sampling in OFDM," *IEEE Trans. on Signal Processing*, vol. 52, no. 11, pp. 3104-3116, Nov. 2004.

G. B. Giannakis and C. Tepedelenioglu, "Basis expansion models and diversity techniques for blind equalization of time-varying channels," *Proceedings of the IEEE*, vol. 86, pp. 1969-1986, Oct. 1998.



Trevor Thornton

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Research Expertise: Nanostructures, molecular electronics and sensors, microelectro-mechanical systems (MEMS), silicon-on-insulator MEFETs

Trevor Thornton joined the faculty in 1998 after having spent eight years at Imperial College in London and two years as a member of the technical staff at Bell Communications Research, New Jersey. He 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. Professor Thornton has published more than 150 journal and conference papers and has seven issued patents related to the commercial development of CMOS compatible MEFETs.

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

Selected Publications:

W. Lepkowski, M. R. Ghajar, S. J. Wilk, N. Summers, and T. J. Thornton "Scaling SOI MEFETs to 150-nm CMOS technologies," *IEEE Transactions on Electron Devices*, vol. 58, issue 6, pp. 1628-1634, June 2011.

S. Wilk, A. Balijepalli, J. Ervin, W. Lepkowski, and T. J. Thornton, "Silicon on insulator MEFETs for RF amplifiers," *Solid-State Electronics*, vol. 54, pp. 336-342, 2010.

P. Joshi, A. Smolyanitsky, L. Petrossian, M. Goryll, M. Saraniti, and T. J. Thornton, "Field effect modulation of ionic conductance of cylindrical silicon-on-insulator nanopore array," *Journal of Applied Physics*, vol. 107, pp. 054701-054706, 2010.

W. Lepkowski, J. Ervin, S. J. Wilk, and T. J. Thornton, "SOI MEFETs fabricated using fully depleted CMOS technologies," *IEEE Electron Device Letters*, vol. 30, pp. 678-680, 2009.

B. R. Takulapalli, G. M. Laws, P. A. Liddell, J. Andreasson, Z. Erno, D. Gust, and T. J. Thornton, "Electrical detection of amine ligation to a metalloporphyrin via a hybrid SOIMOSFET," *J. Am. Chem. Soc.*, vol. 130, pp. 2226-2233, 2008.



Konstantinos Tsakalis

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

Konstantinos Tsakalis joined the ASU faculty in 1988 and is currently a professor. He received his MS in chemical engineering in 1984, an MS in electrical engineering in 1985, and a PhD in electrical engineering in 1988, all from the University of Southern California. He holds nine patents and has published one book, 50 journal and 103 conference papers.

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

Selected Publications:

K. Tsakalis, N. Vlassopoulos, G. Lentaris, and D. Reisis, "A control-theoretic approach for efficient design of filters in DAC and digital audio amplifiers," *Circuits, Systems and Signal Processing*, vol. 30, issue 2, pp. 421-438, Apr. 2011.

L. B. Good, S. Sabesan, S. T. Marsh, K. Tsakalis, D. M. Treiman, and L. D. Iasemidis, "Nonlinear dynamics of seizure prediction in a rodent model of epilepsy," *Nonlinear Dynamics, Psychology and Life Sciences*, vol. 14, no. 5, pp. 411-434, 2010.

L. Yang, J. Si, K. S. Tsakalis, and A. A. Rodriguez, "Performance evaluation of direct heuristic dynamic programming using control-theoretic measures," *J. Intell. Robot Syst.*, vol. 55, pp. 177-201, 2009.

S. Sabesan, L. B. Good, K. S. Tsakalis, A. Spanias, D. M. Treiman, and L. D. Iasemidis, "Information flow and application to epileptogenic focus localization from intracranial EEG," *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, vol. 17, issue 3, pp. 244-253, June 2009.

L. B. Good, S. Sabesan, S. T. Marsh, K. Tsakalis, D. M. Treiman, and L. D. Iasemidis, "Control of synchronization of brain dynamics leads to control of epileptic seizures in rodents," *International Journal of Neural Systems (IJNS)*, vol. 19, issue 3, pp. 173-196, 2009.

N. Chakravarthy, K. Tsakalis, S. Sabesan, and L. Iasemidis, "Homeostasis of brain dynamics in epilepsy: A feedback control systems perspective of seizures," *Annals of Biomedical Engineering*, vol. 37, no. 3, pp. 565-585, 2009.



Daniel Tylavsky

Associate Professor, PhD, Pennsylvania State University
 tylavsky@asu.edu; (480) 965-3460

Research Expertise: 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

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.

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

Selected Publications:

L. M. Beard, J. B. Cardell, I. Dobson, F. Galvan, D. Hawkins, W. Jewell, M. Kezunovic, T. J. Overbye, P. K. Sen, and D. J. Tylavsky, "Key technical challenges for the electric power industry and climate change," *IEEE Trans. on Energy Conversion*, vol. 25, no. 2, pp. 465-473, June 2010.

D. Shi, D. J. Tylavsky, K. M. Koellner, N. Logic, and D. E. Wheeler, "Transmission line parameter identification using PMU measurements," *Euro. Trans. Electr. Power*, vol. 20, pp. 1-15, 2010.

D. Toomey, W. D. Schulze, R. Thomas, J. Thorp, D. J. Tylavsky, and R. E. Schuler, "Efficient market design and public goods: Pt I economic models," *International Journal of Emerging Electric Power Systems*, vol. 11, issue 1, pp. 1-15, article 4, (DOI 10.2202/1553-799X.2299), 2010.

D. Toomey, W. D. Schulze, R. Thomas, J. Thorp, D. J. Tylavsky, and R. E. Schuler, "Efficient market design and public goods: Pt. II theoretical results," *International Journal of Emerging Electric Power Systems* vol. 11, issue 1, pp. 1-16, article 5, (DOI 10.2202/1553-799X.2300), 2010.



Dragica Vasileska

Professor, PhD, Arizona State University
 vasileska@asu.edu; (480) 965-6651

Research Expertise: Semiconductor device physics, semiconductor transport, 1-D to 3-D device modeling, quantum field theory and its application to real device structures, spin transport, heating effects in nano-scale devices, current collapse in GaN HEMTs, optoelectronics including modeling of solar cells and photodetectors

Dragica Vasileska joined the ASU faculty in August 1997. She has published over 150 journal articles in prestigious refereed journals, 15 book chapters and presented 158 articles in conferences in the areas of solid-state electronics, transport in semiconductors, and semiconductor device modeling. She is the second largest contributor in the NSF Network for Computational Nanotechnology's www.nanoHUB.org with a total of 290 contributions and more than 15 educational simulation modules. She is an author of four books (D. Vasileska and S. M. Goodnick, *Computational Electronics*, Morgan & Claypool, 2006; D. Vasileska, Editor, *Cutting Edge Nanotechnology*, March 2010, D. Vasileska, S. M. Goodnick and G. Klimeck: *Computational Electronics: From Semi-Classical to Quantum Transport Modeling*, CRC Press, June 2010, and D. Vasileska, Editor, *Nanoelectronic Devices: Semiclassical and Quantum Transport Modeling*, Springer, in press). She has also given numerous invited talks. She is a senior member of IEEE, the American Physical Society and Phi Kappa Phi.

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

Selected Publications:

A. Ashok, D. Vasileska, O. Hartin, and S. M. Goodnick, "Electro-thermal Monte Carlo simulation of GaN HEMTs including electron-electron interactions," *IEEE Transactions on Electron Devices*, vol. 57, pp. 562-570, 2010.

K. Raleva, D. Vasileska, S. M. Goodnick, and M. Nedjalkov, "Modeling thermal effects in nanodevices," *IEEE Transactions on Electron Devices*, vol. 55, issue 6, pp. 1306-1316, June 2008.

K. Raleva, D. Vasileska, and S. M. Goodnick, "Is SOD technology the solution to heating problems in SOI devices?," *Electron Device Letters, IEEE*, vol. 29, issue 6, pp. 621-624, June 2008.



Vijay Vittal

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

Vijay Vittal joined the ASU faculty in 2005. Prior to ASU, he was an Anston Marston Distinguished Professor at the Iowa State University's, Electrical and Computer Engineering Department. In addition, he was a Murray and Ruth Harpole Professor and director of the university's Electric Power Research Center and site director of the NSF/IUCRC Power System Engineering Research Center (PSERC). Currently, he is the director of PSERC, headquartered at ASU. From 1993 to 1994, he served as the program director of power systems for the NSF Division of Electrical and Communication Systems in Washington, D.C. He was the editor-in-chief of the *IEEE Transactions on Power Systems* from 2005-2011. Professor Vittal has published 122 articles in refereed journals, 105 refereed conference proceeding articles, nine books and book chapters, and 13 research and technical reports.

Honors and Distinctions: Member, National Academy of Engineering, 2004; Ira A. Fulton Chaired Professor; Iowa State University College of Engineering Anson Marston Distinguished Professor, 2004; Foundation Award for Outstanding Achievement in Research, 2003; IEEE Fellow; IEEE Power Engineering Society Technical Council Committee of the Year Award, 2000-2001; Outstanding Power Engineering Educator Award, PES, IEEE, 2000; Warren B. Boast Undergraduate Teaching Award, 2000.

Selected Publications:

G. Xu, V. Vittal, A. Meklin, and J. E. Thalmann, "Controlled islanding demonstrations on the WECC system," *IEEE Transactions on Power Systems*, vol. 26, no. 1, pp. 334-343, Feb. 2011.

D. Gautam, L. Goel, R. Ayyanar, V. Vittal, and T. Harbour, "Control strategy to mitigate the impact of reduced inertia due to doubly fed induction generators on large power systems," *IEEE Transactions on Power Systems*, vol. 26, no. 1, pp. 214-224, Feb. 2011.

V. Vittal, "The impact of renewable resources on the performance and reliability of the electricity grid," *The Bridge, National Academy of Engineering*, vol. 40, no. 1, pp. 5-12, Spring 2010.



Hongbin Yu

Assistant Professor, PhD, University of Texas at Austin
yuhb@asu.edu; (480) 965-4455

Research Expertise: Nanostructure and nano device fabrication and characterization, nanoelectronics, flexible and transparent electronics, transport in metallic and semiconducting nanostructures and molecules, quantum size effect in metallic and semiconducting nanostructures, surface and interface physics and chemistry

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

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

Selected Publications:

Wei Xu, Saurabh Sinha, Tawab Dastagir, Hao Wu, Bertan Bakkaloglu, Donald S. Gardner, Yu Cao, and Hongbin Yu, "Performance enhancement of on-chip inductors with permalloy magnetic rings," *IEEE Electron Device Letter*, vol. 32, issue 1, pp. 69-71, (DOI 10.1109/LED.2010.2089779), 2011.

Baoquan Ding, Hao Wu, Wei Xu, Hongbin Yu, and Hao Yan, "Interconnecting cold islands with DNA origami nanotubes," *Nano Lett.*, vol. 10, 33073, 2010.

Wei Xu, Saurabh Sinha, Feng Pan, Tawab Dastagir, Yu Cao, and Hongbin Yu, "Improved frequency response of on-chip inductors with patterned magnetic dots," *IEEE Electron Device Lett.*, vol. 31, 207, 2010.

Cunjiang Yu, Kevin O'Brien, Yong-Hang Zhang, Hongbin Yu, and Hanqing Jiang, "Tunable optical gratings based on buckled nano-scale thin films on transparent elastomeric substrates," *Appl. Phys. Lett.*, vol. 96, 041111, 2010.

Wei Xu, Alan Chin, Laura Ye, Cun-Zheng Ning, and H. Yu, "Electrical and optical characterization of individual GaSb nanowires," *Proc. of SPIE*, vol. 7224, 72240G, 2009.



Hongyu Yu

Assistant Professor, PhD, University of Southern California
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Research Expertise: Wireless environmental sensing and communication, microfluidic analysis systems, acoustic transducers, micro seismometer, accelerometer, and mass spectrometer

Hongyu Yu joined in ASU in 2008 holding a joint position at the School of Earth and Space Exploration and the School of Electrical, Computer and Energy Engineering. He received his BS and MS degrees in electronics engineering from Tsinghua University, Beijing, China, in 1997 and 2000, respectively, and a PhD degree in electrical engineering from the University of Southern California in 2005. His research area is focused on microelectromechanical systems (MEMS) for earth and space exploration. His goal is to provide miniaturized portable platforms and instruments for scientists to explore 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, 3D MEMS/NEMS manufacturing and wireless circuit component development.

Selected Publications:

X. Qiu, J. Oiler, J. Zhu, Z. Wang, R. Tang, C. Yu, and H. Yu, "Film bulk acoustic-wave resonator based relative humidity sensor using ZnO films," *Electrochemical and Solid-State Letters*, vol. 13, J65-J67, 2010.

J. Zhu, C. Lee, E.S. Kim, D. Wu, C. Hu, Q. Zhou, K.K. Shung, and H. Yu, "High-overtone self-Focusing acoustic transducers for high frequency ultrasonic Doppler," *Ultrasonics*, online first (<http://dx.doi.org/10.1016/j.ultras.2010.02.002>).

X. Qiu, J. Zhu, J. Oiler, C. Yu, Z. Wang, and H. Yu, "Film bulk acoustic-wave resonator based ultraviolet sensor," *Applied Physics Letter*, vol. 94, 16, (DOI: 10.1063/1.3122342), 2009.

C. Yu, Z. Wang, H. Yu, and H. Jiang, "A stretchable temperature sensor based on elastically buckled thin film devices on elastomeric substrates," *Applied Physics Letter*, vol. 95, issue 14, Oct. 2009.

H. Yu, L. S. Ai, M. Rouhanizadeh, D. Patel, E. S. Kim, and T. K. Hsiai, "Flexible polymer sensors for in vivo intravascular shear stress analysis," *J. Microelectromech. Syst.*, vol. 17, issue 5, pp. 1178-1186, 2008.



Junshan Zhang

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Research Expertise: Network optimization and management, cyber-physical systems with applications to smart grid, wireless communications, complex network dynamics, and stochastic modeling and analysis

Junshan Zhang joined the ASU faculty as an assistant professor in August 2000. He received the BS degree in EE from HUST, China, in 1993, the MS degree in statistics from the University of Georgia in 1996, and the PhD degree 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 was general chair for IEEE Communication Theory Workshop 2007. He will be TPC co-chair for INFOCOM 2012. He is currently serving as an editor for *Computer Networks Journal* and *IEEE Wireless Communication Magazine*.

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

Selected Publications:

P. S. C. Thejaswi, J. Zhang, S. Pun, V. H. Poor, and D. Zheng, "Distributed opportunistic scheduling with two-level channel probing," *IEEE/ACM Transactions on Networking*, 2010.

D. Zheng, W. Ge, and J. Zhang, "Distributed opportunistic scheduling for ad-hoc networks with random access: An optimal stopping approach," *IEEE Transactions on Information Theory*, vol. 55, issue 1, p. 205-222, Jan. 2009.

J. Zhang, D. Zheng, and M. Chiang, "The impact of stochastic noisy feedback on distributed network utility maximization," *IEEE Transactions on Information Theory*, vol. 54, issue 2, p. 645-665, Feb. 2008.



Yanchao Zhang

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Research Expertise: Network and distributed system security, wireless networking, and mobile computing.

Yanchao Zhang joined Arizona State University in June 2010 as an associate professor in the School of Electrical, Computer, and Energy Engineering. Before ASU, he was an assistant professor of electrical and computer engineering at New Jersey Institute of Technology from 2006 to 2010. He is an associate editor of IEEE Transactions on Vehicular Technology and a feature editor of IEEE Wireless Communications. He was a guest editor of IEEE Wireless Communications special issue on security and privacy in emerging wireless networks in 2010 and a TPC co-chair of the Communication and Information System Security Symposium, IEEE GLOBECOM 2010. He also routinely serves as a TPC member for major international conferences such as INFOCOM, ICDCS, ICNP, MobiHoc, PerCom, and SECON.

Honors and Distinctions: NSF CAREER Award, 2009.

Selected Publications:

Jinyuan Sun, Chi Zhang, Yanchao Zhang, and Yuguang Fang, "SAT: A security architecture achieving anonymity and traceability in wireless mesh networks," IEEE Transactions on Dependable and Secure Computing (TDSC), vol. 8, no. 2, pp. 295-307, Mar. 2011.

Jing Shi, Rui Zhang, and Yanchao Zhang, "A spatiotemporal approach to secure range queries in tiered sensor networks," IEEE Transactions on Wireless Communications, vol. 10, no. 1, pp. 264-273, Jan. 2011.

Jinyuan Sun, Chi Zhang, Yanchao Zhang, and Yuguang Fang, "An identity-based security system for vehicular ad hoc networks," IEEE Transactions on Parallel and Distributed Computing (TPDS), vol. 21, no. 9, pp. 1227-1239, Sep. 2010.

Rui Zhang, Yanchao Zhang, and Xiaoxia Huang, "JR-SND: Jamming-resilient secure neighbor discovery in mobile ad hoc networks," International Conference on Distributed Computing Systems (ICDCS 2011), Minneapolis, Minnesota, June 2011.

Rui Zhang and Yanchao Zhang, "LR-Seluge: Loss-resilient and secure code dissemination in wireless sensor networks," International Conference on Distributed Computing Systems (ICDCS 2011), Minneapolis, Minnesota, June 2011.



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Selected Publications:

E. H. Steenbergen, M. J. DiNezza, W. H. G. Dettlaff, S. H. Lim, and Y.-H. Zhang, "Optically-addressed two-terminal multi-color photodetector," Appl. Phys. Lett., no. 97, pp. 161111-161114, 2010.

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