**Department of Electrical Engineering 2011 Annual Report**

# Department Personnel

### Tenured and Tenure Track Faculty

**Kultegin Aydin** [**(Ph.D. Orta Dogu Teknik Universitesi, Ankara, Turkey)**](http://130.203.201.244/Directory/FacultyInfo/Aydin/AydinProfilePage.aspx)
Professor of Electrical Engineering and Interim Department Head
Radar remote sensing, radar meteorology, radiowave propagation, electromagnetic scattering, and computational modeling.
IEEE Fellow

**Sven Bilén** [**(Ph.D. University of Michigan)**](http://130.203.201.244/Directory/FacultyInfo/Bilen/BilenProfilePage.aspx)
Associate Professor of Engineering Design, Electrical Engineering, and Aerospace Engineering
Electrodynamic tethers, plasma diagnostics, spacecraft-plasma interactions, spacecraft systems, software-defined radio, wireless sensor networks, innovation in engineering design, and systems engineering.

[**James Breakall (Ph.D. Case Western Reserve University)**](http://130.203.201.244/Directory/FacultyInfo/Breakall/BreakallProfilePage.aspx)
Professor of Electrical Engineering
Antenna modeling and design, numerical modeling, computational and experimental electromagnetic, and ionospheric radio wave propagation and probing.

[**Suman Datta (Ph.D. University of Cincinnati)**](http://130.203.201.244/Directory/FacultyInfo/Datta/DattaProfilePage.aspx)Professor of Electrical Engineering and Material Research Institute Affiliate
Device modeling, nanofabrication and characterization specializing in advanced silicon and non-silicon semiconductor based devices for ultra low-power logic and embedded memory applications.

[**John Doherty (Ph.D. Rutgers University)**](http://130.203.201.244/Directory/FacultyInfo/Doherty/DohertyProfilePage.aspx)
Professor of Electrical Engineering
Signal processing and communications, which includes specific applications to remote sensing, electronic intelligence, and biomedical engineering.

[**William E. Higgins (Ph.D. University of Illinois – Urbana-Champaign)**](http://130.203.201.244/Directory/FacultyInfo/Higgins/HigginsProfilePage.aspx)
Distinguished Professor of Electrical Engineering and Computer Science and Engineering
Image processing, computer vision, scientific visualization, computer graphics, medical imaging, and graphical user interfaces.
IEEE Fellow

[**Thomas Jackson (Ph.D. University of Michigan)**](http://130.203.201.244/Directory/FacultyInfo/Jackson/JacksonProfilePage.aspx)Robert E. Kirby Chair Professor of Electrical Engineering and Material Research Institute Affiliate
Exploratory electronic devices and microfabrication techniques. Thin film electronics, organic semiconductors, oxide semiconductors, biomolecular motors, biodevices, microelectromechanical systems, and display technology.
IEEE Fellow

[**Kenneth Jenkins (Ph.D. Purdue University)**](http://130.203.201.244/Directory/FacultyInfo/Jenkins/JenkinsProfilePage.aspx)Professor of Electrical Engineering
Digital filtering, signal processing algorithms, multidimensional array processing, computer imaging, one and two-dimensional adaptive digital filtering, and VLSI architecture for signal processing.
IEEE Fellow

[**Timothy Kane (Ph.D. University of Illinois – Urbana-Champaign)**](http://130.203.201.244/Directory/FacultyInfo/Kane/KaneProfilePage.aspx)Professor of Electrical Engineering, Adjunct Professor of Meteorology, and Research Associate at the Applied Research Laboratory
Optical remote sensing (specifically laser radar or LIDAR) atmospheric and oceanic measurements and modeling, data analysis, and interpretation.

[**Mohsen Kavehrad (Ph.D. Polytechnic Institute of New York University)**](http://www.ee.psu.edu/Directory/FacultyInfo/Kavehrad/KavehradProfilePage.aspx)W.L. Weiss Chair Professor of Electrical Engineering
Wireless communications and networking RF and optical, communications and signal processing systems and networks, optical fiber communications and networks, and optical network components.
IEEE Fellow

[**George Kesidis (Ph.D. University of California – Berkeley)**](http://www.ee.psu.edu/Directory/FacultyInfo/Kesidis/KesidisProfilePage.aspx)Professor of Computer Science and Engineering and Electrical Engineering
High-speed communication/computer networks; traffic engineering including shaping, routing and scheduling; network security; overlay systems; and performance evaluation including modeling, simulation and emulation.

[**Iam-Choon Khoo (Ph.D. University of Rochester)**](http://www.ee.psu.edu/Directory/FacultyInfo/Khoo/KhooProfilePage.aspx)
William E. Leonhard Professor Electrical Engineering
Theories and experiments in photonic devices, nonlinear- and electro- optics materials such as liquid crystals, fibers and nano-structured, and novel refractive matamaterials.
IEEE Fellow; Optical Society of America Fellow; United Kingdom Institute of Physics Fellow

[**Constantino Lagoa (Ph.D. University of Wisconsin)**](http://www.ee.psu.edu/Directory/FacultyInfo/Lagoa/LagoaProfilePage.aspx)Professor of Electrical Engineering
Robust control, controller design under risk specifications, system identification, robust and chance constrained optimization, control of computer networks, and discrete event dynamical systems.

[**Ji-Woong Lee (Ph.D. University of Michigan)**](http://www.ee.psu.edu/Directory/FacultyInfo/Lee/LeeProfilePage.aspx)Assistant Professor of Electrical Engineering
Analysis and synthesis of hybrid, stochastic, and decentralized systems and statistical learning.

[**Yanxi Liu (Ph.D. University of Massachusetts – Amherst)**](http://www.ee.psu.edu/Directory/FacultyInfo/Liu_Y/Liu_YProfilePage.aspx)Associate Professor of Computer Science and Engineering and Electrical Engineering
Computational symmetry group theory and application, machine learning (particularly low-dimensional subspace learning from very large, multi-modality feature set), computer-aided diagnosis, computer vision, computer graphics, biomedical image analysis/indexing/retrieval, and robotics.

[**Zhiwen Liu (Ph.D. California Institute of Technology)**](http://www.ee.psu.edu/Directory/FacultyInfo/Liu_Z/Liu_ZProfilePage.aspx)Associate Professor of Electrical Engineering
Ultrafast and nonlinear optics, optical imaging, nonlinear spectroscopy, and holography.

[**John Mathews (Ph.D. Case Western Reserve University)**](http://www.ee.psu.edu/Directory/FacultyInfo/Mathews/MathewsProfilePage.aspx)Professor of Electrical Engineering
Radar remote sensing, digital signal processing, ionospheric physical and chemical processes, and radar codes.

## [Jeffrey Mayer (Ph.D. Purdue University)](http://www.ee.psu.edu/Directory/FacultyInfo/Mayer_J/Mayer_JProfilePage.aspx)Associate Professor of Electrical Engineering Power systems dynamics, electrical machinery, drive systems, energy conversion, and controls.

[**Theresa Mayer (Ph.D. Purdue University)**](http://www.ee.psu.edu/Directory/FacultyInfo/Mayer_T/Mayer_TProfilePage.aspx)Professor of Electrical Engineering and Associate Director of Material Research Institute
III-V and novel semiconductor material systems, molecular beam epitaxy, device fabrication, and modeling.

[**John Metzner (Ph.D. New York University)**](http://www.ee.psu.edu/Directory/FacultyInfo/Metzner/MetznerProfilePage.aspx)Professor of Computer Science and Engineering and Electrical Engineering
Data and computer communication, error correcting codes, and information theory.
IEEE Fellow

[**David Miller (Ph.D. University of California – Santa Barbara)**](http://www.ee.psu.edu/Directory/FacultyInfo/Miller/MillerProfilePage.aspx)Professor of Electrical Engineering
Pattern recognition, machine learning, source coding, joint source-channel coding, bioinformatics, networking and network intrusion detection, and image segmentation.

[**John Mitchell (Ph.D. Penn State)**](http://www.ee.psu.edu/Directory/FacultyInfo/Mitchell/MitchellProfilePage.aspx)Professor of Electrical Engineering
Electronics, instrumentation, and aeronomy.

[**Raj Mittra (Ph.D. University of Toronto)**](http://www.ee.psu.edu/Directory/FacultyInfo/Mittra/MittraProfilePage.aspx)Professor of Electrical Engineering
Computational electromagnetic, EMI/EMC electromagnetic modeling and simulation of electronic packages, RF and wireless systems analysis and design, and communication antenna design.
IEEE Fellow

[**Vishal Monga (Ph.D. University of Texas – Austin)**](http://www.ee.psu.edu/Directory/FacultyInfo/Monga/MongaProfilePage.aspx)
Monkowski Professor of Electrical Engineering
Detection theory, lattice theory, optimization and their applications to multimedia security and mining, color image processing and statistical learning for multimedia, document processing, and genomics.

[**Ram Narayanan, (Ph.D. University of Massachusetts – Amherst)**](http://www.ee.psu.edu/Directory/FacultyInfo/Narayanan/NarayananProfilePage.aspx)Professor of Electrical Engineering
Antenna characterization and measurements, microwave system design and development, radar remote sensing theory and applications, and remote sensing image analysis.
IEEE Fellow, SPIE Fellow, and IETE Fellow

[**Victor Pasko (Ph.D. Stanford University)**](http://www.ee.psu.edu/Directory/FacultyInfo/Pasko/PaskoProfilePage.aspx)Professor of Electrical Engineering
Atmospheric electrodynamics, atmospheric acoustic-gravity waves, gas discharge phenomena, computational plasma physics, and electromagnetics.

[**Jerzy Ruzyllo (Ph.D. Warsaw University of Technology, Poland)**](http://www.ee.psu.edu/Directory/FacultyInfo/Ruzyllo/RuzylloProfilePage.aspx)Distinguished Professor of Electrical Engineering
Semiconductor materials and devices; integrated circuits manufacturing science and engineering; semiconductor surface modification processes and characterization; gate dielectric processing in advanced CMOS technology; and methods of semiconductor, including semiconductor quantum dots, and dielectric thin film formation.
IEEE Fellow and Electrochemical Society Fellow

[**Jeffrey Schiano (Ph.D. University of Illinois – Urbana-Champaign)**](http://www.ee.psu.edu/Directory/FacultyInfo/Schiano/SchianoProfilePage.aspx)Associate Professor of Electrical Engineering
Control systems and feedback control of quantum mechanical processes.

[**Srinivas Tadigadapa (Ph.D. Cambridge University, United Kingdom)**](http://www.ee.psu.edu/Directory/FacultyInfo/Tadigadapa/TadigadapaProfilePage.aspx)Professor of Electrical Engineering and Material Research Institute Affiliate
Design, fabrication, and characterization of microelectromechanical systems (MEMS), integration of smart materials into MEMS devices, biological MEMS, inertial MEMS, and RF MEMS devices.

[**Kenji Uchino (Ph.D. Tokyo Institute of Technology, Japan)**](http://www.ee.psu.edu/Directory/FacultyInfo/Uchino/UchinoProfilePage.aspx)Professor of Electrical Engineering and Material Research Institute Affiliate
Dielectrics/ferroelectrics/piezo-electrics, device design/fabrication, solid state actuators, transducers, positioners, and ultrasonic motors.

[**Julio Urbina (Ph.D. University of Illinois – Urbana-Champaign)**](http://www.ee.psu.edu/Directory/FacultyInfo/Urbina/UrbinaProfilePage.aspx)Assistant Professor of Electrical Engineering
Radar design, digital systems and space instrumentation, analog design, software designed radio and radars, radio wave propagation, meteor detection, system integration, radio wave remote sensing, and radar studies of the atmosphere and ionosphere.

[**Douglas Werner (Ph.D. Penn State)**](http://www.ee.psu.edu/Directory/FacultyInfo/Werner/WernerProfilePage.aspx)John L. and Genevieve H. McCain Chair Professor of Electrical Engineering
Theoretical and computational electromagnetics, antenna analysis and design, electromagnetic wave interaction with complex materials, fractal and knot electrodynamics, and genetic algorithms in electromagnetics.
IEEE Fellow

[**Aylin Yener (Ph.D. Rutgers University)**](http://www.ee.psu.edu/Directory/FacultyInfo/Yener/YenerProfilePage.aspx)Professor of Electrical Engineering
Wireless communications and networking, information theory, and communication theory.

[**Shizhuo Yin (Ph.D. Penn State)**](http://www.ee.psu.edu/Directory/FacultyInfo/Yin/YinProfilePage.aspx)Professor of Electrical Engineering
Massive optical memories, medical optics, photo refractive materials, optical computing, and fiber-optic communications.
Optical Society of America Fellow and International Society for Optical Engineering Fellow

[**Qiming Zhang (Ph.D. Penn State)**](http://www.ee.psu.edu/Directory/FacultyInfo/Zhang/ZhangProfilePage.aspx)Distinguished Professor of Electrical Engineering and Material Research Institute Affiliate
Integrated micro-actuators and microsensors, electroactive polymer and nanomaterial system energy devices for electrical energy storage and conversion, ferroelectric/piezoelectric polymer thin film fabrication and thin film devices, and theory and modeling of electroactive polymers and nanomaterial systems based on them.
IEEE Fellow

### Non-Tenure Track Teaching Faculty

**Svetla Jivkova (Ph.D. Bulgarian Academy of Sciences)**Associate Professor of Electrical Engineering
Optical arbitrary waveform generation using ultra-short pulsed lasers, optical wireless communications, computer-generated holograms, and dynamic holography in photorefractive crystals.

[**Salvatore Riggio (Ph.D. Florida Atlantic University)**](http://www.ee.psu.edu/Directory/FacultyInfo/Riggio/RiggioProfilePage.aspx)Associate Professor of Electrical Engineering
Discrete and integrated analog and digital circuits and devices, microcontrollers, power electronics, motors and generators, communications, controls, amateur radio and television systems.

[**David Salvia (M.S. Penn State)**](http://www.ee.psu.edu/Directory/FacultyInfo/Salvia/SalviaProfilePage.aspx)
Assistant Professor of Electrical Engineering and Undergraduate Program Coordinator
Teaches courses in the areas of digital signal processing, communications, and signals/systems.

[**Mark Wharton (M.S. University of Colorado)**](http://www.ee.psu.edu/Directory/FacultyInfo/Wharton/WhartonProfilePage.aspx)Associate Professor of Electrical Engineering
Baseband, IF, RF, and microwave circuit design.
Teaches undergraduate-level courses in electronics and senior project design.

[**Timothy Wheeler (B.S. Cornell University)**](http://www.ee.psu.edu/Directory/FacultyInfo/Wheeler/WheelerProfilePage.aspx)Research Assistant
Design and fabrication of remote sensors for the sounding rocket environment.

### Additional Faculty Appointments

1. **Courtesy title**
Mary Jane Irwin, Robert E. Noll Professor, Computer Science and Engineering

Thomas Laporta, Distinguished Professor, Computer Science and Engineering

Suzanne Mohney, Professor, Materials Science and Engineering

Vijaykrishnan Narayanan, Professor, Computer Science and Engineering

[Joan Redwing**,**](http://www.ee.psu.edu/Directory/FacultyInfo/Redwing/RedwingProfilePage.aspx) Professor, Materials Science and Engineering

1. **Adjunct title**

Lars Dyrud, John Hopkins University, Applied Physics Laboratory

Ruyan Guo, University of Texas at San Antonio
Heath Hofmann, University of Michigan

Kwang Lee, Baylor University
David Machuga, Northrup Grumman Corporation

David Meisel, State University of New York, Geneseo

David L. Miller, Consultant

Robert Nickel, Bucknell University

Thomas Seliga

### Instructors

Christopher Barber, Research Associate, Penn State Applied Research Laboratory
Mark Bregar – Research and Development Engineering, Penn State Applied Research Laboratory
Jon Huang, Ph. D. student, Department of Electrical Engineering
Eli Hughes, Research and Development Engineer, Penn State Applied Research Laboratory
David Jenkins, Research Associate, Penn State Applied Research Laboratory
Michael Lin, Ph.D. student, Department of Computer Science and Engineering
Keith Lysiak – Senior Research Associate, Penn State Applied Research Laboratory
Andrew Mayers, Instructor, Department of Electrical Engineering
Christopher Rogan, Research Engineer, Penn State Applied Research Laboratory

1. **Emeritus Faculty**William Adams, Professor Emeritus

Larry Burton, Associate Dean Emeritus
Lynn Carpenter, Associate Professor Emeritus
Charles Croskey, Professor Emeritus
L. Eric Cross, Evan Pugh Professor Emeritus
Anthony Ferraro, Distinguished Professor Emeritus
Dale Grimes, Professor Emeritus
Paul Hulina, Associate Professor Emeritus
Stewart Kurtz, Professor Emeritus
Kwang Lee, Professor Emeritus
John Lewis, Professor Emeritus
George McMurtry, Professor Emeritus
John Nisbet, Alumni Professor Emeritus
Russell Philbrick, Professor Emeritus
James Robinson, Professor Emeritus
William Ross, Professor Emeritus
Christopher Wronski, Professor Emeritus
Francis Yu, Evan Pugh Professor Emeritus

1. **Visiting Scholars**

Ming-yuan Chen (China), sponsored by Constantino Lagoa
Peng Deng (China), sponsored by Mohsen Kavehrad
Tianyu Dong (China), sponsored by Raj Mittra
Zhuqian Gong (China), sponsored by Raj Mittra
Qingxin Guo (China), sponsored by Raj Mittra
Sungtek Kahng (Korea), sponsored by Raj Mittra
Jong-Sung Kim (Korea), sponsored by Raj Mittra
Yong Up Lee (Korea), sponsored by Mohsen Kavehrad
Daquiang Qiu (China), sponsored by Constantino Lagoa
Jihui Wang, sponsored by Stuart Yin

1. **Post-doctoral Scholars**
Zikri Bayraktar, sponsored by Doug Werner
Jie Li, sponsored by Theresa Mayer
Marcelo Pisani, sponsored by Srinivas Tadigadapa

Alexej Pogrebnyakov, sponsored by Theresa Mayer
Sumanta Sarkhel, sponsored by John Mathews
Kebin Shi, sponsored by Zhiwen Liu
Igor Stanojev, sponsored by Aylin Yener
Safakcan Tuncdemir, sponsored by Kenji Uchino
Jian Wu, sponsored by Theresa Mayer
Heayoung Yoon, sponsored by Theresa Mayer
Seokho Yun, sponsored by Theresa Mayer
Yong Zeng, sponsored by Doug Werner
Yuan Zhuang, sponsored by Kenji Uchino

### Staff

Connie Burger, Accounting Assistant III
Marsha Church, Senior Systems Analyst
Julie Corl, Administrative Support Assistant
Dave DeCapria, Engineering Lab Manager
Lena Getman, Staff Assistant
MaryAnn Henderson, CSSL/EO Administrative Support Assistant
Claudia Horner, Graduate Admissions Administrative Support Assistant
Fawn Houtz, Clean Room Staff Lab Coordinator
SherryDawn Jackson, Graduate Records Administrative Support Assistant
Anna Kennedy, Graduate Admissions Administrative Support Assistant
Debra Lauder, Signal and Systems Area Administrative Support Assistant
Catherine McClellan, Public Relations Specialist
Kris McNitt, Proposal and Grant Generalist
Dawn Nelson, Department Head Administrative Support Assistant
Donna O’Shea, Systems Administrator
Lloyd Peterson, Supervisor of Engineering Labs
Gabriele Rhinehart, Undergraduate Administrative Support Assistant
Mona Shaw, Department Head Administrative Support Assistant
Pam Stauffer, Administrative Support Coordinator
Lisa Timko, Graduate Admissions Administrative Support Assistant
Janet Woomer, Administrative Support Assistant

# Academic Programs

### Undergraduate Program (juniors and seniors)

1. **Enrollment**
Fall 2011: 455
2. **Enrollment trends**

Note: Enrollment follows national trends. These numbers include juniors and seniors only.

1. **Bachelor’s Degrees Conferred 2011**

Spring: 94
Summer: 15
Fall: 46

1. **Undergraduate Scholarships and Fellowships**

*Fred and Kit Bigony Scholarship in Engineering*

Chunyan Li
Elorm K. Yador

Bigony Trustee Scholarship

 Steven E. Drew

*Boeing Helicopters Company Scholarship*

Nicole V. Legenski
Keegan S. McCoy

*Larry C. and Barbara A. Burton Student Award in Electrical Engineering*
Edward Y. Wang

*Cobham plc Trustee Matching Scholarship in the College of Engineering
Qian Ye*

*College of Engineering, Engineering General Scholarship Fund*
Jarell T. Mason
Jason B. Morris
Adriyel V. Nieves
Olabimpe A. Ogunmoyero
Quin Ye

*College of Engineering, Engineering Minority Scholarship Fund*
Jorge L. Calderon Vega III
Landon O. Hernandez
Jarell T. Mason
Jason B. Morris
Adriyel V. Nieves
Olabimpe A. Ogunmoyero
Christian M. Pastor
Christopher J. Payne
Mindy R. Sanchez
Desire’ N. Williams
Elorm K. Yador

*Donald and Nancy Devorris Scholarship in Electrical Engineering*
Luke D. Shepley

*Engineering General Scholarship*Muhammed K. Hassan Jacob A. Huttel Jorge L. Calderon Vega III
Zhihao Jiang Mu Li Kacie M. Long
Jason B. Morris Tuan N. Ngo William J. Orosz
Christian M. Pastor Ryan A. Purcell Matthew R. Quigley
Rebecca H. Ripley Elorm K. Yador Chuan Yang
Athena M. Abate Mohamed Z. Abdel-Mageed

*Donald G. Ferguson Memorial Honors*Rebecca H. Ripley

*Frank Gabron Scholarship in Electrical Engineering*
Richard S. Teal

*Priscilla E. Guthrie Scholarship in Electrical Engineering*
Chirag M. Amin

*Donald W. Hamer Scholarship in Electrical Engineering*Justin M. Carbonara
Sean T. Elward

*Clifford B. Holt, Jr. Memorial Scholarship in Electrical Engineering*Rebecca H. Ripley
Yufei Wu

*James R. Kruest Scholarship in Electrical Engineering*
Nicole V. Legenski

*Hai-Sup Lee Memorial Scholarship in Electrical & Computer Engineering*
Michael V. Bilyk

*Kwang Y. and Sangwol Lee Trustee Scholarship in the College of Engineering*
Pooua P. Pathak
Jinzhao Wu

*James H. Lum Scholarship in Engineering*Patrick K. Lee

*William J. Madden and Ethel Harer Madden Memorial Honors Scholarship in Engineering*
Sean T. Elward Nicholas J. Matone Keegan S. McCoy
Amanda C. Mills Eric J. Tim Dominique S. Zwiebel
Michael V. Bilyk

*William J. Madden and Ethel Harer Madden Memorial Scholarship in Engineering*
Andriy Bokalo Kevin R. Brodmerkel Travis C. Buffington
Ethan J. Cook Erik M. Duffy Jeffrey N. Fliegel
Samuel M. Foran Landon O. Hernandez Tyler R. Horwat
Ryan E. Kachline Sung Hoon Kim Mark A. Liberto Jr.
Aakash H. Mehta Dominic P. Misja Shawn M. Moffit
Joshua F. Myers Joshua A. Noble Joseph B. Picarelli Jr.
Jeegar A. Shah Kyle T. Snoddy Katlyn J. Stepansky
William C. Trego Anthony J. Villanti Kyle A. Wagner
Weilin Xue Elorm K. Yador Athena M. Abate
Matthew G. Agostinelli Moustafa K. Ahmed Ling An

*William J. Madden and Ethel Harer Madden Memorial Trustee Scholarship in Engineering*
Ryan M. Black Nathan R. Blinn Jonathan T. Bogash
Ian M. Brooks Steven M. Devore Adam R. Falcsik
Sean E. Flamm Anthony El Kohr David W. Lambert
Dylan Levan Kyle T. Marsh Aitzaz Nathaniel
Jonathan P. Ore Sarah E. Parks Nishith Patel
Kyle C. Scherer David R. Sedlock Andrew R. Sharp
Luke D. Shepley Michael J. Stachnik Louis W. Wust III
Chirag M. Amin Michael R. Amthor

*Steven Messori Memorial Scholarship*
Christian M. Pastor

*Frank Blaise Modruson/Lynne C. Shigley Scholarship*Christopher J. Shotter Jr.

*The Shuman H. & Elizabeth B. Moore Engineering Scholarship*
Aitzaz Nathaniel
Mark A. Bartels

*Paul Morrow Endowed Scholarship*Boni Li
Joseph P. Tucket
Edward Y. Wang

*Fred A. Pechter Scholarship*Ryan M. Black
Adam R. Falcsik
Jason A. Gill
Tyler R. Horwat
David W. Lambert
Dylan Levan

*Harry P. and Henrietta K. Pierce Scholarship*Zachary C. Bluedorn

*Harold I. Tarpley Memorial Scholarship Fund*
Dominique S. Zwiebel

*Christopher M. Wharton Trustee Scholarship*Thomas M. Connors

*Howard J. Waltemeyer Sr. Scholarship
Charles L. Sie*

1. **Undergraduate Awards**

*James M. Barnak/Eta Kappa Nu Outstanding Senior Award*
Miles H. Frain
Keegan McCoy

*Eta Kappa Nu Outstanding Junior Award*
Steven Devore

*Electrical Engineering student marshal*
Spring: Drew Schmitt

### Graduate Program

1. **Enrollment**

Fall 2011 M.S.: 64

Fall 2011 Ph.D.: 135

1. **Enrollment trends**
2. **Master’s Degrees Conferred - total 30**
	1. **Spring 2011**

Nathawut Homsup, “Performance Comparisons of Channel Coding Techniques for Digital Satellite Communications” (paper), advised by John Metzner

Sneha Kadetotad, “Terrain-Aided Localization using Feature-Based Particle Filtering,” advised by Constantino Lagoa

Yifeng Liu, “Review of Recent Advance in WDM Network” (paper), advised by Shizhuo (Stuart) Yin

Chandrasekhar Mothali, “Attacking Anonymization and Constructing Improved Differentially Private Classifiers,” advised by David Miller

Salil Mujumdar, “Strain Engineering for Strained P-Channel Non-Planar Tri-Gate Field Effect Transistors,” advised by Suman Datta

Anand Raja, “Towards Understanding People in Videos,” advised by Kenneth Jenkins

Bharath Ramaswamy, “Kalman Filter Based Estimation of Inertial Measurement Unit Parameters in a Portable Biomechanical Assessment Suite,” advised by Kenneth Jenkins

Sucharita Ray, “Metric Driven Mobility Modeling in Tactical Networks,” advised by George Kesidis

Jeremiah Turpin, “Uniaxial Metamaterials for Microwave Far-Field Collimating Lenses,” advised by Douglas Werner

Yaxing Yu, “Investigation of Nanostructure Enhanced Surface Plasmonic Sensor: Principles and Applications” (paper), advised by Shizhuo (Stuart) Yin

* 1. **Summer 2011**

Ashish Agrawal, “Experimental Study of Low-Field Transport in Highly Confined Arsenide- Antimonide Quantum Well Heterostructures,” advised by Suman Datta

Rachana Reddy Agumamidi, “Hard Sensor Processing for Data Fusion,” advised by David Miller

Dharav Dantara, “Reconfigurable Accelerators for Neuromorphic Systems,” advised by Suman Datta

Ganesh Iyer, “An Approach to Hard and Soft Sensors' Data Fusion and Analysis” (paper), advised by Kenneth Jenkins

Rajaram Narayanan, “Carbon Nanotube Flow Sensors: A Comprehensive Study,” advised by Theresa Mayer

Madan Parameswaran, “Study of Path Planning Functions,” advised by Constantino Lagoa

Chinmay Rao, “A Study of Intra-Electrode Correlation and Its Application to Neural Spike Detection,” advised by Kenneth Jenkins

Bharath Rengarajan, “An Approximate Expectation-Maximization Like Approach to Spatio- Temporal Belief-Propagation for Moving Object Detection,” advised by David Miller

Clinton Scarborough, “Low-Loss Radio-Frequency Electromagnetic Metamaterials Applied to Antennas and Imaging,” advised by Douglas Werner

Mahadevan Srinivasan, “A Neural Network Based Approach for Predicting a Patient's Conversion to Alzheimer's Disease Based on Brain Scan Data,” advised by David Miller

Thomas Tyson, “Marginal Oscillator Conversion Gain: Prediction Simulation, and Experimental Measurements,” advised by Jeffrey Schiano

Guixi Zou, “A Flow Classifier with Tamper-Resistant Features an an Evaluation of Its Portability to New Domains,” advised by David Miller

1. **Fall 2011**

Divij Bhatia, “Study of Semiconductor Near-Surface Region using Photoconductive Decay Technique,” advised by Jerzy Ruzyllo

Aarti Chandrashekhar, “A Fine-Grained Dataflow Library for Reconfigurable Streaming Accelerators,” advised by Suman Datta

Jason Dalenberg, “Design and Analysis of a Magnetic Levitation System for Control Systems Courses,” advised by Jeffrey Schiano

Chaitanya Kamath, “Internet Traffic Classification Using Machine Learning Techniques (paper),” advised by George Kesidis

Sina Khaleghi, “Control Methods in Power System Restoration” (paper), advised by George Kesidis

Chanakya Mehta, “Applying Systems Thinking to Develop a Design Space and Business Strategy Exploration Tool for Technology-Based Ventures in Developing Communities,” advised by Sven Bilén

Khoa Tran, “Zebra Recognition Using Wavelets and Machine Learning,” advised by David Miller

Yuhao Wang, “Model Analysis and Robust Control Design in VSC-HVDC Systems Based on Direct Power Control” (paper), advised by Jeffrey Mayer

1. **Doctoral Degrees Conferred – total 22**
	1. **Spring 2011**Zikri Bayraktar, “Novel Meta-Surface Design Snythesis via Nature-Inspired Optimization Algorithms,” advised by Douglas Werner

	Haifeng Li, “Nonlinear Nanoprobes for Characterizing Ultrafast Optical Near Field,” advised by Zhiwen Liu

	Justin Liou, “All-Optical Switching with Dye-Doped Liquid Crystals,” advised by Iam-Choon Khoo

	Chandrasekhar Radhakrishnan, “Fault Tolerant Signal Processing for VLSI Circuits,” advised by Kenneth Jenkins

	Aaron Vallett, “Fabrication and Characterization of Semiconducting Nanowires for Tunnel Field Effect Transistors,” advised by Theresa Mayer

	Qian Xu, ”Nonlinear Microscopy and Spectroscopy,” advised by Zhiwen Liu

	Michael Zugger, “Modeling Radiometric and Polarized Light Scattering from Exoplanet Oceans and Atmospheres,” advised by Timothy Kane
	2. **Summer 2011**

Okhtay Azarmanesh, “A Novel Approach to Modulation Classification in Cognitive Radios,” advised by Sven Bilén

Junbin Huang, “Nonlinear Liquids and Mechanisms for All-Time-Scale Optical Limiting Effects,” advised by Iam-Choon Khoo

Thomas Latempa, “Visible Light Active, Nano-Architectured Metal Oxide Photo-Catalysts for Solar Fuel Applications,” advised by Constantino Lagoa

Chu-Fang Lin, “Novel Generative Semisupervised Learning Based on Fine-Grained Component-Conditional Class Labeling,” advised by David Miller

Ming-Wei Liu, “Joint Specific Emitter Identification and Tracking using Device Non- linearity Estimation,” advised by John Doherty

Valerie Mistoco, “Modeling of Small Scale Radio-Frequency Inductive Discharges for Electric Propulsion Applications,” advised by Sven Bilén

Aria Pezeshk, “Feature Extraction and Text Recognition from Scanned Color Topographic Maps,” advised by Kenneth Jenkins

Chinmay Rao, “Validation of Symbolic Dyanmics Filtering Using Bayesian Filtering Approaches,” advised by Kenneth Jenkins

Arnab Roy, “Signal Analysis using Raised Cosine Empirical Mode Decomposition,” advised by John Doherty

Safakcan Tuncdemir, “Design, Modeling and Control of a Novel Multi Functional Transla- tional-Rotary Micro Ultrasonic Motor,” advised by Kenji Uchino

Seok Ho Yun, “Novel Optical Metamaterials, Absorbers, and Filters Based on Periodic Nanostructures,” advised by Theresa Mayer

Yuan Zhuang, “Loss Phenomenology and the Methodology to Derive Loss Factors in Piezoelectric Ceramics,” advised by Srinivas Tadigadapa

1. **Fall 2011**James Basham, “Broadening Spectral Response in Solid-State Dye-Sensitized Solar Cells via Forster Resonance Energy Transfer,” advised by James Breakall

Zhao Fang, “Ultra Sensitive Magnetic Sensors Integrating the Giant Magneto- electric Effect with Advanced Microelectronics,” advised by Qiming Zhang

Qihe Pan, “RFID Radar Tag System Design using Ultrawideband Noise Waveforms,” advised by Ram Narayanan
2. **Graduate Scholarships and Fellowships**

*Paul F. Anderson Graduate Fellowship in Electrical Engineering*Benjamin D. McPheron
Peter E. Siebert

*Luther B. and Patricia A. Brown Graduate Fellowship*Dustin P. Fairchild
Philip J. Gorman
Benjamin D. McPheron
Andrew M. Swisher

*Joseph R. and Janice M. Monkowski Graduate Fellowship in EE*
Dustin P. Fairchild
Philip J. Gorman

*Pontano Family Scholarship in Electrical Engineering*Sonny Smith

*Fred C. and M. Joan Thompson Graduate Fellowship in Electrical Engineering*
Jose I. Ramirez

*Allan L. Rayfield Graduate Fellowship*Matthew J. Hollander

*Society of Penn State Electrical Engineers Graduate Fellowship*
Donovan E. Brocker
Dustin P. Fairchild
Spencer Martin
Robert M. Sorbello Jr.

*Bess L. and Mylan R. Watkins Graduate Fellowship in Electrical Engineering*
Patrick D. Byrnes

1. **Graduate Awards**

*Melvin P. Bloom Memorial Outstanding Doctoral Research Award*Qian Xu
Yuan Zhuang

*Nirmal K. Bose Dissertation Excellence Award*Haifeng Li
Chandrasekhar Radhakrishnan

*The A. J. Ferraro Graduate Research Award*
Clinton Scarborough
Haifeng Li

1. **Courses**

|  |
| --- |
| **First Year Seminars:****EE007 EE008**Adventures in Electrical Engineering Digital Music**EE009 EE009**Intro to Ham Radio This is Rocket Science**EE009** Loudspeaker Design  |
| **EE200**Design Tools | **EE210**Circuits and Devices |
| **EE211**Electrical Circuits and Power Distribution (non majors) | **EE212**Introduction to Electronic Measuring Systems (non majors) |
| **EE300W**Design Process | **EE310**Electronic Circuit Design I |
| **EE311**Electronic Circuit Design II | **EE316****Introduction to Embedded Microcontrollers** |
| **EE320****Introduction to Electro-Optical Engineering** | **EE330****Engineering Electromagnetics** |
| **EE340**Introduction to Nanoelectronics | **EE350****Continuous-Time Linear Systems** |
| **EE351****Discrete-Time Linear Systems** | **EE353**Signals and Systems (non majors) |
| **EE360****Communications Systems I** | **EE362**Communication Networks |
| **EE380**Linear Control Systems | **EE387****Energy Conversion** |
| **EE403W**Senior Project Design | **EE410**Linear Electronic Design |
| **EE413**Power Electronics | **EE416**Digital Integrated Circuits |
| **EE417**Digital Design Using Field Programmable Devices | **EE420**Electro-optics: Principles and Devices |
| **EE421**Optical Fiber Communications | **EE422**Optical Engineering Laboratory |
| **EE424**Principles and Applications of Lasers | **EE430**Principles of Electromagnetic Fields |
| **EE432**UHF and Microwave Engineering | **EE438**Antenna Engineering |
| **EE439**Radiowave Propagation in Communications | **EE441****Semiconductor Integrated Circuit Technology** |
| **EE442**Solid State Devices | **EE453****Fundamentals of Digital Signal Processing** |
| **EE454****Fundamentals of Computer Vision** | **EE455**An Introduction to Digital Image Processing |
| **EE460**Communication Systems II | **EE471**Introduction to Plasmas |
| **EE472**Space Astronomy and Introduction to Space Science | **EE474**Satellite Communications Systems |
| **EE477**Fundamentals of Remote Sensing Systems | **EE482**Introduction to Digital Control Systems |
| **EE487**Electric Machinery and Drives | **EE488**Power Systems Analysis I |
| **EE497**Software Defined Radio | **EE 497**Probability and Random Processes for Electrical Engineers |
| **EE497**Space Systems Engineering Seminar | **EE500**Graduate Colloquium |
| **EE510**Linear Integrated Circuits | **EE520**Electro Optics--Systems and Computing |
| **EE521**Fiber Optics and Integrated Optics | **EE522**Electro-Optics Laboratory |
| **EE524**Lasers and Optical Electronics | **EE526**Nonlinear Optical Materials |
| **EE531**Engineering Electromagnetics | **EE534**Conformal Antennas |
| **EE535**Boundary Value Methods of Electromagnetics | **EE537**Numerical and Asymptotic Methods of Electromagnetics |
| **EE538**Antenna Engineering | **EE541**Manufacturing Methods in Microelectronics |
| **EE542**Semiconductor Devices | **EE543**Ferroelectric Devices |
| **EE544**Micromechatronics | **EE545**Semiconductor Device Reliability |
| **EE546**Field-Effect Devices | **EE547**Dielectric Devices |
| **EE549**Acoustic Wave Devices | **EE551**Wavelets, Filter Banks And Multi-Resolution Analysis |
| **EE552**Pattern Recognition--Principles and Applications | **EE553**Topics in Digital Signal Processing |
| **EE554**Topics in Computer Vision | **EE555**Digital Image Processing II |
| **EE556**Graphs, Algorithms and Neural Networks | **EE557**Multidimensional Signal Processing |
| **EE560**Probability, Random Variables, and Stochastic Processes | **EE561**Information Theory |
| **EE562**Detection and Estimation Theory | **EE564**Error Correcting Codes for Computers and Communication |
| **EE565**Reliable Data Communications | **EE567**Wireless and Mobile Communications |
| **EE568**Digital Communications I | **EE569**Digital Communications II |
| **EE574**Propagation Through Random Media | **EE576**Inversion Techniques in Remote Sensing |
| **EE579**Microwave Radar Remote Sensing | **EE580**Linear Control Systems |
| **EE581**Optimal Control | **EE582**Adaptive and Learning Systems |
| **EE584**Robust Control Theory | **EE587**Nonlinear Control and Stability |
| **EE588**Power Systems Control and Operation |  |
| **EE597** Special Topics CoursesNanoscale TransportProbablity Limit TheoriesRadar SystemsSemiconductor CharacterizationStochastic Control |

#  Department Research

### Research Areas

### [Communications and Networking](http://www.ee.psu.edu/Research/Communicationsandnetworking.aspx)Digital communications, computer networking, intelligent networks, multimedia communications, mobile computing, local area wireless networks (RF and optical), portable and mobile communications, optical fiber communications, optical networking, coding and information theory, satellite communications, and propagation measurements and modeling

*Faculty members: John Doherty, Mohsen Kavehrad, George Kesidis, John Metzner, and Aylin Yener*

[**Control Systems**](http://www.ee.psu.edu/Research/Controlsystems.aspx)
Multiobjective and probabilistic robust control, nonlinear systems, intelligent distributed control, adaptive control, active vision, and quantum control
*Faculty members: Constantino Lagoa, Ji-Woong Lee, and Jeffrey Schiano*

[**Electromagnetics**](http://www.ee.psu.edu/Research/Electromagnetics.aspx)
Computational electromagnetics, wave scattering and propagation, interactions with complex media and novel materials, electrodynamics, antenna analysis and design, scattering cross section and antenna measurements, computer visualization, RF and microwave systems, MMIC, EMI, and EMC, and electronic packaging
*Faculty members: James Breakall, Raj Mittra, and Douglas Werner*

[**Electronic Materials and Devices**](http://www.ee.psu.edu/Research/Electronicmaterialsanddevices.aspx)
Materials and devices for electronic, photonic, bioelectronic and MEMS applications: amorphous and crystalline silicon, III-V compounds, organic thin films, ferroelectric and piezo-electric; development of novel device structures and manufacturing methods, device and circuit simulation and modeling, and device and material characterization
*Faculty members: Suman Datta, Thomas Jackson, Theresa Mayer, Jerzy Ruzyllo, Srinivas Tadigadapa, Kenji Uchino, and Qiming Zhang*

[**Optical Materials and Devices**](http://www.ee.psu.edu/Research/Opticalmaterialsanddevices.aspx)Electro-optics, photonic and nonlinear optical materials, devices and applications; tunable photonic crystals; laser switching and optical information processing; liquid crystalline materials and devices; fiber optics and waveguides, holography
*Faculty members: Iam-Choon Khoo, Zhiwen Liu, and Shizhuo Yin*

[**Power Systems**](http://www.ee.psu.edu/Research/Powersystems.aspx)
Power system planning, operation, and control, intelligent system applications to power systems, computational tools for power electronic design, and quiet motor drives
*Faculty members: Jeffrey Mayer*

[**Remote Sensing and Space Systems**](http://www.ee.psu.edu/Research/Remotesensingandspacesystems.aspx)Active (radar and LIDAR) and passive (radiometry) remote sensing of the atmosphere; radar, radiometer, and LIDAR systems; rocket and satellite instrumentation; atmospheric electrodynamics; meteoric effects in the ionosphere; modeling of atmospheric processes; and plasma physics
*Faculty members: Kultegin Aydin, Sven Bilén, Timothy Kane, John Mathews, John Mitchell, Ram Narayanan, Victor Pasko, and Julio Urbina*

[**Signal and Image Processing**](http://www.ee.psu.edu/Research/Signalandimageprocessing.aspx)
Multidimensional signal processing, signal reconstruction theory and algorithms, signal compression, spectral estimation, image processing, medical image analysis, neural networks, multiple target tracking in clutter, adaptive filtering, and data fusion
*Faculty members: William Higgins, Kenneth Jenkins, Yanxi Liu, David Miller, and Vishal Monga*

## Articles Published in Refereed Journals

***Listed by author, title, journal, and date.***

Avramov, A.E., A.S. Ackerman, A.M. Fridlind, B. van Diedenhoven, G. Botta, **K. Aydin**, J. Verlinde, A. Korolev, W. Strapp, G.M. McFarquhar, R. Jackson, S.D. Brooks, A. Glenn, and M. Wolde, “Towards ice formation closure in arctic mixed‐phase boundary layer clouds during ISDAC,” Journal of Geophysical Research, 2011.

G. Botta, **K. Aydin**, J. Verlinde, A. E. Avramov, A. S. Ackerman, A. M. Fridlind, G. M. McFarquhar, and M. Wolde, “Millimeter wave scattering from ice crystals and their aggregates: Comparing cloud model simulations with X- and Ka-band radar measurements,” Journal of Geophysical Research., 2011.

Shabnam Sodagari and **Sven G. Bilén**, "On cost-sharing mechanisms in cognitive radio networks,” European Transactions on Telecommunications, 2011.

S. Sodagari, A. Attar, and **S.G. Bilén**, "On a Truthful Mechanism for Expiring Spectrum Sharing in Cognitive Radio Networks," IEEE Journal on Selected Areas in Communications, 2011.

G. A. Lehmacher, , T. D. Scott, M. F. Larsen, **S. G. Bilén**, C. L. Croskey, J. D. Mitchell, M. Rapp, F.-J. Lübken, and R. L. Collins, "The Turbopause experiment: atmospheric stability and turbulent structure spanning the turbopause altitude," Ann. Geophys., 2011.

A. Ali, B. Bennett, B. Boos, H. Madan, A. Agrawal, P. Schiffer, R. Misra and **S. Datta**, "Experimental Determination of Quantum and Centroid Capacitance in Arsenide-Antimonide Quantum-Well MOSFETs Incorporating Non-Parabolicity Effect," IEEE Transactions on Electron Devices, January 2011.

E.Hwang, S.Mookerjea, M.K Hudait, **S.Datta**, "Investigation of scalability of In0.7Ga0.3As quantum well field effect transistor (QWFET) architecture for logic applications," Solid-State Electronics, August 2011.

Vinay Saripalli, Guangyu Sun, Asit Mishra, Yuan Xie, **Suman Datta** and Vijaykrishnan Narayanan, "Exploiting Heterogeneity for Energy Efficiency in Chip Multiprocessors," IEEE Journal on Emerging and Selected Topics in Circuits and Systems, June 2011.

Matthew J Hollander, Michael LaBella, Zachary R Hughes, Michael Zhu, Kathleen A Trumbull, Randal Cavalero, David W Snyder, Xiaojun Wang, Euichul Hwang, **Suman Datta**, and Joshua A Robinson, "Enhanced Transport and Transistor Performance with Oxide Seeded High-k Gate Dielectrics on Wafer-Scale Epitaxial Graphene," Nano Letters, August 2011.

A. Ali, H. Madan, A. Agrawal, I. Ramirez, R. Misra, J. B. Boos, B. R. Bennett, J. Lindemuth and **S. Datta**, "Enhancement Mode Antimonide Quantum Well MOSFETs with High Electron Mobility and GHz Small-Signal Switching Performance," IEEE Electron Device Letters, , December 2011.

Zhao Fang, Ninad Mokhariwale, Feng Li, **Suman Datta**, and **Q. M. Zhang**, “Magnetoelectric Sensors with Directly Integrated Charge Sensitive Readout Circuit ─ Improved Field Sensitivity and Signal-to-Noise Ratio,” IEEE SensorsJournal, 2011.

A. Roy and **J. F. Doherty**, "Raised cosine filter-based empirical mode decomposition," IET Signal Processing, April 2011.

A. Roy and **J. F. Doherty**, "Overlay Communications using Empirical Mode Decomposition," IEEE Systems Journal, March 2011.

M. Liu and **J. F. Doherty**, "Nonlinearity Estimation for Specific Emitter Identification in Multipath Channels," IEEE Transactions on Information Forensics & Security, September 2011.

S. U. Pawar and **J. F. Doherty**, "Modulation Recognition in Continuous Phase Modulation using Approximate Entropy," IEEE Transactions on Information Forensics & Security, Special Issue on Using the Physical Layer for Securing the Next Generation of Communications Systems, September 2011.

Kongkuo Lu, Pinyo Taeprasartsit, Rebecca Bascom, Rickhesvar P.M. Mahraj, and **William E. Higgins**, "Automatic Definition of the Central-Chest Lymph-Node Stations," International Journal of Computer Assisted Radiology and Surgery, July 2011.

Kongkuo Lu and **William E. Higgins**, "Segmentation of the central-chest lymph nodes in 3D MDCT images," Computers in Biology and Medicine, September 2011.

Michael W. Graham, Jason D. Gibbs, and **William E. Higgins**, “Computer-based route-definition system for peripheral bronchoscopy,'' Journal of Digital Imaging, 2011.

Brandon, M. Vozoff, E. A. Kolawa, G. F. Studor, F. Lyons, M. W. Keller, B. Beiermann, S. R. White, N. R. Sottos, M. A. Curry, D. L. Banks, R. Brocato, L. Zhou, Soyoun Jung, **T. N. Jackson**, and K. Champaigne, "Structural Health Management Technologies for Inflatable/Deployable Structures: Integrating Sensing and Self-Healing," Acta Astronautica, 2011.

R. J. Kline, S. D. Hudson, X. Zhang, D. J. Gundlach, Andrew J. Moad, O. D. Jurchescu, **T. N. Jackson**, S. Subramanian, J. E. Anthony, M. F. Toney, and L. J. Richter , "Controlling the Microstructure of Solution-Processable Small Molecules in Thin-Film Transistors through Substrate Chemistry," Chemistry of Materials 2011.

M. Uppalapati, Y.-M. Huang, V. Aravamuthan, **T. N. Jackson**, and W. O. Hancock, “Artificial Mitotic Spindle Generated by Dielectrophoresis and Protein Micropatterning Supports Bidirectional Tranport of Kinesin-Coated Beads,” Integrative Biology, 2011.

D. B. Saint John, H. B. Shin, M. Y. Lee, S. K. Ajmera, A. J. Syllaios, E. C. Dickey, **T. N. Jackson**, and N. J. Podraza, “Influence of Microstructure and Composition on Hydrogenated Silicon Thin Film Properties for Uncooled Microbolometer Applications,” Journal of Applied Physics, August 2011.

S. Trolier-McKinstry, G. Griggio, C. Yaeger, P. Jousse, D. L. Zhao, S. S. N. Bharadwaja, **T. N. Jackson**, S. Jesse, S. V. Kalinin, and K. Wasa, “Designing Piezoelectric Films for Micro Electromechanical Systems,” IEEE Transactions. Ultrasonics Ferroelectrics and Frequency Control, September 2011.

 M.E. Zugger, J. F. Kasting, D. M. Williams, **T. J. Kane** and C. R. Philbrick “Searching for water earths in the near-infrared,” The Astrophysical Journal, 2011.

J.S. Kim, D. Spencer, **T.J. Kane**, and **J. Urbina**, “Improvement of numerical TIE-GCM by incorporating Helium data from the empirical NRLMSISE-00 model,” Journal of Atmospheric and Terrestrial Physics, 2011.

Sh. You, W. Shao, W. Cai, H. Cao, and **M. Kavehrad**, "Analysis of Ultra-short Pulse Shaping with Programmable Amplitude and Phase Masks," Chinese Optics Letters, Vol. 9, March 10, 2011.

G. Zou, **G. Kesidis**, **D. J. Miller**, “A Flow Classifier with Tamper-Resistant Features and an Evaluation of Its Portability to New Domains,” IEEE Journal on Selected Areas in Communications, August 2011.

G. Carl, **G. Kesidis**, “Modeling a Policy-capable Path-vector Routing Protocol Using Jacobi Iteration over a Path Algebra,” Computer Networks , July 2011.

E. Altman, P. Bernhard, S. Caron, **G. Kesidis,** J. Rojas-Mora, S. Wong, “A Study of Non-Neural Networks with Usage-based Pricing,” Telecommunication Systems Journal, Special Issue on Socio-economic Issues of Next Generation Networks, June 2011

Tony J. Huang, Y. J. Liu, B. Yue, J. Liou and **I. C. Khoo**, "All-Optical Modulation of Localized Surface Plasmon Coupling in a Hybrid System Composed of Photo-Switchable Gratings and Au Nanodisk Arrays," Journal of Physical Chemistry, 2011.
 **I. C. Khoo**, J. Liou, M. V. Stinger, S. Zhao, “Ultrafast All-Optical Switching with Transparent and Absorptive Nematic Liquid Crystals-Implications in Tunable Metamaterials,” [MolecularCrystals & Liquid Crystals](http://www.tandf.co.uk/journals/titles/1058725x.html), 2011.

Tony J. Huang, Y. J. Liu, B. Yue, J. Liou and **I. C. Khoo**, "All-Optical Modulation of Localized Surface Plasmon Coupling in a Hybrid System Composed of Photo-Switchable Gratings and Au Nanodisk Arrays," Journal of Physical Chemistry, 2011.

Pawlik Grzegorz, Walasik Wiktor, Mitus Antoni C and **I. C. Khoo**, “Large gradients of refractive index in nanosphere dispersed liquid crystal metamaterial with inhomogeneous anchoring: Monte Carlo study,” Optical Materials 2011.

Li Jia, Ma Yi, Gu Ying, Q. Gong, and **I. C. Khoo** et al, “Large spectral tunability of narrow geometric resonances of periodic arrays of metallic nanoparticles in a nematic liquid crystal,” Applied Physics Letters, 2011.

Zhang Bingxin, Zhao Yanhui, Hao Qingzhen, **I. C. Khoo**, “Polarization-independent dual-band infrared perfect absorber based on a metal-dielectric-metal elliptical nanodisk array,” Optics Express, August 2011.

Hao Qingzhen, Zhao Yanhui, Juluri Bala Krishna, **I. C. Khoo**, and Tony Huang, “Frequency-addressed tunable transmission in optically thin metallic nanohole arrays with dual-frequency liquid crystals,” Journal of Applied Physics, 2011.

**I. C. Khoo** and A. Diaz, “Multiple-time-scales dynamical studies of nonlinear transmission of pulsed lasers in a multi-photon absorbing organic material,” Journal of the Optical Society of America,” July 2011.

**I. C. Khoo**, “Extreme nonlinear optics of nematic liquid crystals,” Journal of the Optical Society of America, 2011.

Smalley Joseph S. T.; Zhao Yanhui; Nawaz Ahmad Ahsan; **I. C. Khoo**; Tony Huang, “High contrast modulation of plasmonic signals using nanoscale dual-frequency liquid crystals,” Optics Express, 2011.

Lei Ye, Zhijun Wang, Hao Che, **C.M. Lagoa** , "TERSE: A Unified End-to-End Traffic Control Mechanism to Enable Elastic, Delay Adaptive, and Rate Adaptive Services," IEEE Journal on Selected Areas in Communications, May 2011.

Chao Feng; F. Dabbene, **C.M. Lagoa,** "A Kinship Function Approach to Robust and Probabilistic Optimization Under Polynomial Uncertainty," , IEEE Transactions on Automatic Control, July 2011.

**J.-W. Lee** and G. E. Dullerud, “Supervisory control and measurement scheduling for discrete-time linear systems,” IEEE Transactions on Automatic Control, 2011.

W. Zhuang, D. Yu, **Z. Liu,** and J. Chen, "Multi-threshold second-order phase transition in laser," Chinese Science Bulletin, 2011.

M. Zhou, C. Yang, **Z. Liu**, J. P. Cysyk, S. Zheng, "An implantable Fabry-Pérot pressure sensor fabricated on left ventricular assist device for heart failure," Biomed Microdevices, 2011.

H. Li, P. S. Edwards, Z. Zhang, B. Zhang, Y. Xu, V. Gopalan, and **Z. Liu**, "Characterization of the second-harmonic response of second-order nonlinear probes," Journal of the Optical Society of America, 2011.

Q. Sun, W. Zhuang, **Z. Liu**, and J. Chen, "Electrodeless-discharge-vapor-lamp-based Faraday anomalous-dispersion optical filter," Optics Letters, 2011.

Q. Xu, K. Shi, and **Z. Liu**, “Time-resolved coherent anti-Stokes Raman spectroscopy impulsively excited by supercontinuum,” Journal of Raman Spectroscopy, 2011.

C. Yang, P. Edwards, K. Shi, and **Z. Liu**, "Proposal and demonstration of a spectrometer using a diffractive optical element with dual dispersion and focusing functionality," Optics Letters, 2011.

C. Daengngam, M. Hofmann, **Z. Liu**, A. Wang, J. R. Heflin, and Y. Xu, "Demonstration of a cylindrically symmetric second-order nonlinear fiber with self-assembled organic surface layers," Optics Express, 2011.

A. Malhotra, and **J. D. Mathews**, “A statistical study of meteoroid fragmentation and differential ablation using the Resolute Bay incoherent scatter radar,” Journal of Geophysical Research,” 2011.

I. Seker, S. F. Fung, and **J. D. Mathews**, “The relation between magnetospheric state parameters and the occurrence of plasma depletion events in the night-time mid-latitude F-region,” Journal of Geophysical Research, 2011.

**T. S. Mayer**, J. Kim, B. Won, M. Li, T. Morrow, W. Hu, S. Dean, H. Liu, A. Vallett, C. D. Keating, and **J. S. Mayer,** "Adding New Capabilities to Si CMOS Via Deterministic Nanowire Assembly," Electrochemical Society Transactions, 2011.

K, O. Sarpatwari, O. Awadelkarim, L. J. Passmore, T. T. Ho, M. W. Kuo, N. S. Dellas, **T. S. Mayer**, and S. E. Mohney, “Low-Frequency Three-Terminal Charge Pumping Applied to Silicon Nanowire Field-Effect Transistors,” IEEE Transactions on Nanotechnology, 2011.

V. Koval, S. S. N. Bharadwaja, M. Li, **T. S. Mayer**, and S. Trolier-McKinstry, “Dielectrophoretic Assembly of Lead Zirconate Titanate Microtubes,” Solid State Electronics, 2011.

Y. Ke, X. Wang, X. J. Weng, C. E. Kendrick, Y. A. Yu, S. M. Eichfeld, H. P. Yoon, J. M. Redwing, **T. S. Mayer**, and Y. M. Habib, “Single Wire Radial Junction Photovoltaic Devices Fabricated Using Aluminum Catalyzed Silicon Nanowires,” Nanotechnology, 2011.

D. Mohata, S. Mookerjea, A. Agrawal, Y.Y. Li, **T. Mayer**, V. Narayanan, A. Liu, D. Loubychev, J. Fastenau, **S. Datta**, “Experimental Staggered-Source and N plus Pocket-Doped Channel III-V Tunnel Field-Effect Transistors and their Scalabilities,” Applied Physics Express, 2011.

L. Chen, G. Yu, C. Langefeld, **D.J. Miller** et al., "Comparative analysis of methods for detecting interacting loci", BMC Bioinformatics, 2011.

Y. Aksu**, D.J. Miller**, **G. Kesidis**, D. Bigler, and Q. Yang, “An MRI-derived definition of MCI-to-AD conversion for long-term, automatic prognosis of MCI patients,” PloS One, 2011.

T. Adali, **D.J. Miller**, K. Diamantaras, J. Larsen, “Trends in Machine Learning for Signal Processing,” IEEE Signal Processing Magazine, November 2011.

Rashidi, H. Mosallaei, **R. Mittra**, “Scattering analysis of plasmonic nanorod antennas: A novel numerically efficient computational scheme utilizing macro basis functions,” Journal of Applied Physics, June 2011.

S.G. Hay, J.D. O’Sullivan**, R. Mittra**, “Connected patch array analysis using the characteristic basis function method,” IEEE Transactions on Antennas and Propagation, June 2011.

W. Yu, X. Yang, Y. Liu, **R. Mittra**, D.-C. Chang, C.-H. Liao, M. Akira, W. Li, L. Zhao, "New development of parallel conformal FDTD method in computational electromagnetics engineering," IEEE Transactions on Antennas and Propagation, June 2011.

G. Bianconi, C. Pelletti, R**. Mittra,** K. Du, A. Monorchio, “An efficient technique for the evaluation of the reduced matrix in the context of the CBFM for layered media,” IEEE Antennas and Wireless Propagation Letters, July 2011.

**R. Mittra**, C. Pelletti, K. Panyappan, A. Monorchio, “The Dipole Moment (DM) and Recursive Update in Frequency Domain (RFUD) method: Two novel techniques in computational electromagnetics,” The Radio Science Bulletin, September 2011.

K. Yoo, N. Mehta, **R. Mittra**, “A new numerical technique for analysis of periodic structures,” Microwave and Optical Technology Letters, October 2011.

Y. Zang, B.Z. Wang, W. Shao, W. Yu, **R. Mittra,** “Artificial ground planes for performance enhancement of microstrip antennas,” Journal of Electromagnetic Waves and Applications, 2011.

Y. Zhang, **R. Mittra**, W. Hong, “On the synthesis of a flat lens using a wideband low-reflection gradient-index metamaterial,” Journal of Electromagnetic Waves and Applications, 2011.

W.J. Chen and **R.M. Narayanan**, "Antenna Placement for Minimizing Target Localization Error in Ultrawideband MIMO Noise Radar," IEEE Antennas and Wireless Propagation Letters, 2011.

Q. Pan and **R.M. Narayanan**, "Design of a Covert RFID Tag Network for Target Discovery and Target Information Routing," Sensors, October 2011.

S.C. Surender and **R.M. Narayanan**, "UWB Noise-OFDM Netted Radar: Physical Layer Design and Analysis," IEEE Transactions on Aerospace and Electronic Systems, April 2011.

J. Chuang and **R.M. Narayanan**, "Performance of Non-Polarized Noise Modulated Communications System in the Presence of Interference," Wireless Personal Communications, April 2011.

Q. Pan and **R.M. Narayanan**, "Delay-Modulated RF Tag System using Ultrawideband Noise Radar Waveforms," International Journal of Distributed Sensor Networks, 2011.

J. Qin , S. Celestin, and **V. P. Pasko**, “On the inception of streamers from sprite halo events produced by lightning discharges with positive and negative polarity,” Journal of Geophysical Research, 2011.

M. Fullekrug, R. Roussel-Dupre, E. M. D. Symbalisty, J. J. Colman, O. Chanrion, S. Soula, O. van der Velde, A. Odzimek, A. J. Bennett, **V. P. Pasko**, and T. Neubert, “Relativistic electron beams above thunderclouds,” Atmospheric Chemistry and Physics, 2011.

Z. Bonaventura, A. Bourdon, S. Celestin, and **V. P. Pasko**, “Electric field determination in streamer discharges in air at atmospheric pressure,” Plasma Sources Science and Technology, 2011.

S. Celestin , and **V. P. Pasko**, “Energy and fluxes of thermal runaway electrons produced by exponential growth of streamers during the stepping of lightning leaders and in transient luminous events,” Journal of Geophysical Research, 2011.

J. Ruzyllo, "Semiconductors in 21st Century - the First Decade", Progress in Science and Technology, 2011.

P. Drummond, A. Kshirsagar, and **J. Ruzyllo**, "Characterization of Near-Surface Electrical Properties of Multi-Crystalline Silicon Wafers," Solid-State Electronics, 2011.

P. Drummond, A. Kshirsagar, S. Ramani, and **J. Ruzyllo**, "Studies of PCD Method for Characterization of Near-Surface Electrical Properties of Semiconductors", Thin-Solid Films, 2011.

M. Li , **J.L. Schiano**, J. Samra, and W. Brey "Reduction of Temporal Magnetic Field Fluctuations in High Field Resistive Magnets using Inductive Measurements and Sampled-Data Feedback Control," Journal of Magnetic Resonance, 2011.

Ping Kao, Purnendu Parhi, Anandi Krishnan, Hyeran Noh, Waseem Haider, **Srinivas Tadigadapa**, David L. Allara, Erwin A.Vogler,”Volumetric Interpretation Of Protein Adsorption: Interfacial Packing Of Protein Adsorbed To Hydrophobic Surfaces From Surface-Saturating Solution Concentrations,” Biomaterials, 2011.

Marcelo B. Pisani, Kailiang Ren, Ping Kao, and **Srinivas Tadigadapa**, “Application Of Micromachined Y-Cut Quartz Bulk Acoustic Wave Resonator For Infrared Sensing,” Journal Of Microelectromechanical Systems, 2011.

Hareesh Komepalli, Kiron Mateti, Christohper D. Rahn, and **Srinivas Tadigadapa**, “Piezoelectric T-Beam Actuators,” ASME Journal Of Mechanical Design, 2011.

Ping Kao, David Allara and **Srinivas Tadigadapa**, “Study of Adsorption of Globular Proteins on Hydrophobic Surfaces,” IEEE Sensors Journal, November 2011.

Kailiang Ren, Ping Kao, Marcelo Pisani, and **Srinivas Tadigadapa**, “Monitoring Biochemical Reactions using Y-Cut Quartz Thermal Sensors,” Analyst, 2011.

S. Zhao, **J. Urbina**, L. Dyrud, and R. Seal,” Multilayer Detection and Classification of Specular and Non-specular Meteor Trails,” Radio Science, 2011.

L. P. Dyrud, **J. Urbina**, J. T. Fentzke, E. Hibbit, and J. Hinrichs, “Global variation of meteor trail plasma turbulence,” Journal of the European Geosciences Union, 2011.

Z. Jiang, J. A. Bossard, X. Wang, **D. H. Werner**, "Synthesizing Metamaterials with Angularly Independent Effective Medium Properties Based on an Anisotropic Parameter Retrieval Technique Coupled with a Genetic Algorithm," Journal of Applied Physics, 2011.

M. F. Pantoja, M. G. Bray, **D. H. Werner,** P. L. Werner and A. R. Bretones, "A Computationally Efficient Method for Simulating Metal-Nanowire Dipole Antennas at Infrared and Longer Visible Wavelengths," IEEE Transactions on Nanotechnology, February 2011.

E. Lier, **D. H. Werner**, C. P. Scarborough, Q. Wu and J. A. Bossard, "An Octave-Bandwidth Negligible-Loss Radiofrequency Metamaterial," Nature Materials, March 2011.

M. D. Gregory, Z. Bayraktar, and **D. H. Werner**, "Fast Optimization of Electromagnetic Design Problems Using the Covariance Matrix Adaptation Evolutionary Strategy," IEEE Transactions on Antennas and Propagation, April 2011.

J. Z. Jiang, S. Yun, F. Toor, **D. H. Werner** and **T. S. Mayer,** "Conformal Dual-Band Near-Perfectly Absorbing Mid-Infrared Metamaterial Coating," ACS Nano, April 2011.

J. S. Petko, and **D. H. Werner**, "Pareto Optimization of Thinned Planar Arrays with Elliptical Mainbeams and Low Sidelobe Levels," IEEE Transactions on Antennas and Propagation, May 2011.

Z. Bayraktar, **D. H. Werner** and P. L. Werner, "Miniature Meander-line Dipole Antenna Arrays Designed via an Orthogonal Array Initialized Hybrid Particle Swarm Optimizer," IEEE Antennas and Propagation Magazine, June 2011.

Q. Hao, Y. Zeng, B. K. Juluri, X. Wang, B. Kiraly, I-K. Chiang, L. Jensen**, D. H. Werner,** V. H. Crespi and T. J. Huang, "Metallic Membranes with Subwavelength Complementary Patterns: Distinct Substrates for Surface-Enhanced Raman Scattering," ACS Nano, July 2011.

Y. Zeng, J. Liu, and **D. Werner**, "General Properties of Two-Dimensional Conformal Transformations in Electrostatics," Optics Express, 2011.

Z. H. Jiang, M. D. Gregory, and **D. H. Werner**, "Experimental Demonstration of a Broadband Transformation Optics Lens for Highly Directive Multibeam Emission," Physical Review B, October 2011.

Ertugrul N. Ciftcioglu, Yalin E. Sagduyu, Randall Berry, and **Aylin Yener**, “Cost-Delay Tradeoffs for Two-Way Relay Networks, IEEE Transactions on Wireless Communications,” December 2011.

Omur Ozel, Kaya Tutuncuoglu, Jing Yang, Sennur Ulukus and **Aylin Yener,** “Transmission with Energy Harvesting Nodes in Fading Wireless Channels: Optimal Policies,” IEEE Journal on Selected Areas in Communcations: Energy-Efficient Wireless Communications, September 2011.

Satashu Goel, Vaneet Aggarwal, **Aylin Yener** and A. Robert Calderbank, “The Effect of Eavesdroppers on Network Connectivity: A Secrecy Graph Approach,” IEEE Transactions on Information Forensics and Security, Special Issue on Using the Physical Layer for Securing the Next Generation of Communication Systems, September 2011.

Ye Tian and **Aylin Yener**, “The Gaussian Interference Relay Channel: Improved Achievable Rates and Sum Rate Upperbounds Using a Potent Relay,” IEEE Transactions on Information Theory, Special Issue on Interference Networks, May 2011.

Xiang He and **Aylin Yener,** “The Gaussian Many-to-One Interference Channel with Confidential Messages,” IEEE Transactions on Information Theory, Special Issue on Interference Networks, May 2011.

Yaohui Guo, Meng-Ku Cheng, **Stuart Yin**, Paul Ruffin, Christina Brantley, and Eugene Edwards, “Terahertz enhancement from terahertz-radiation-assisted large aperture photoconductive antenna,” Journal of Applied Physics, 2011.

Sung Hyun Nam, John Lee, and **Stuart Yin,** “Control of resonant peak depths of tunable long period fiber gratings using overcoupling,” Optics Communications, 2011.

J. Zheng, G. Sun, Y. Jiang, T. Wang, A. Huang, Y. Zhang, P. Tang, S. Zhuang, Y. Liu and **S. Yin**, “H-PDLC based waveform controllable optical choppers for FDMF microscopy,” Optics Express, 2011.

M. Hao, C. Wang, J. Yao, Y. Chang, J. Cheng, Y. Zhu, **S. Yin**, C. Luo, “Development of novel flexible black silicon,” Optics Communications, 2011.

Xin Zhou, Qin Chen, and **Q. M. Zhang**, and Shihai Zhang, “Dielectric Behavior of Low temperature PECVD Fabricated Si3N4 and Si3N4/P(VDF-CTFE) Bilayer Films,” IEEE Transactionson Dielectrics and Electrical Insulation, 2011.

R. Pirc, Z. Kutnjak, and R. Blinc and **Q. M. Zhang**, “Upper Bounds on the Electrocaloric Effect in Polar Solids,” Applied Physics Letters 2011.

Junhong Lin, Yang Liu, **Q. M. Zhang**, “Charge Dynamics and Bending Actuation in Aquivion Membrane Swelled with Ionic Liquids,” Polymer 2011.

H. F. Li, **Q.M. Zhang**, and **Z.W. Liu**, “Holographic Imaging of Electric Breakdown in Air,” IEEE Transactions on Dielectrics and Electrical Insulation, 2011.

S. G. Lu, B. Rožič, **Q. M. Zhang**, Z. Kutnjak, Bret Neese, “Enhanced Electrocaloric Effect in Ferroelectric P(VDF-TrFE) 55/45 mol% Copolymer at Ferroelectric-Paraelectric Transition,” Applied Physics Letters, 2011.

Reza Montazami, Sheng Liu, Yang Liu, Dong Wang**, Q. M. Zhang**, and James R. Heflin, “Thickness dependence of curvature, strain, and response time in ionic electroactive polymer actuators fabricated via layer-by-layer assembly,” Journal of Applied Physics*,* 2011.

S. G. Lu, B. Rozic, Z. Kutnjik, and **Q. M. Zhang**, “Electric Effect in Ferroelectric P(VDF-TrFE) Copolymers,” Integrated Ferroelectrics, 2011.

Jiezhu Jin, S-G. Lu, C. Chanthad, **Q. M. Zhang**, M. A. Haque, and Qing Wang, “Multiferroic Polymer Composites with Greatly Enhanced Magnetoelectric Effect under a Low Magnetic Bias,” Advanced Materials, 2011.

Xinyu Li, Xiao-shi Qian, S. G. Lu, Jiping Cheng, Zhao Fang and **Q. M. Zhang**, “ Tunable Temperature Dependence of Electrocaloric Effect in Ferroelectric Relaxor P(VDF-TrFE-CFE) Terpolymer,” Applied Physics Letters, 2011.

Shan Wu, Minren Lin, S.G. Lu, Lei Zhu and **Q. M. Zhang**, “Polar-fluoropolymer Blends with Tailored Nanostructures for High Energy Density Low Loss Capacitor Applications,” Applied Physics, 2011.

Brigita Rozic, Marija Kosec, Hana Ursic, Janez Holc, Barbara Malic, **Q. M. Zhang**, Robert Blinc, Rasa Pirc, and Zdravko Kutnjak,” Influence of the critical point on the electrocaloric response of relaxor ferroelectrics,” Journal of Applied Physics, 2011.

R. Pirc, Z. Kutnjak, and R. Blinc, **Q. M. Zhang**, “Electrocaloric effect in relaxor ferroelectrics,” Journal of Applied Physics, 2011.

Chen Zou, **Q. M. Zhang**, Shihai Zhang, Douglas Kushner, Xin Zhou, Richard Bernard, and Raymond J. Orchard, Jr., “PEN/Si3N4 bilayer film for dc bus capacitors in power converters in hybrid electric vehicles,” Journal of Vacuum Science and Technology, 2011.

B. Rozic, B. Neese, S. G. Lu, **Q. M. Zhang**, and Z. Tutnjak, “Direct Measurements of the ELectrocaloric Effect in P(VDF-TrFE) 68/32 Copolymer Ferroelectric Films,” Ferro, 2011.

B. Rozic, S. G. Liu, Z. Kutnjak, B. Neese, and **Q. M. Zhang, “** Electrocaloric Effect in the Relaxor Ferroelectric Terpolymer P(VDF-TrFe-CFE),” Ferro, 2011.

S. G. Lu, J. Z. Jin, X. Zhou, Z. Fang, Q. Wang, and **Q. M. Zhang**, “Large magnetoelectric coupling coefficient in poly(vinylidene fluoride-hexafluoropropylene)/Metglas laminates, Journal of Applied Physics, 2011.

1. Articles Published in Refereed Proceedings
***Listed by author(s), title, meeting, date.***

P. W. A. Roming, **S. G. Bilén**, D. N. Burrows, A. D. Falcone, D. B. Fox, T. L. Herter, J. A. Kennea, M. L. McConnell, and J. A. Nousek, "Joint Astrophysics Nascent Universe Satellite: Utilizing GRBs as High Redshift Probes," Conference on GRBs as Probes: From the Progenitor's Environment to the High Redshift Universe, Como, Italy, May 2011.

James Nemes, Kriten S. Hochstedt, Mary Lynn Brannon, Elizabeth C. Kisenwether, Robert M. Capuro, and **Sven G. Bilén**, "SE Capstone: Introduction of Systems Engineering into an Undergraduate Multidisciplinary Capstone Course," 2011 ASEE Annual Conference, Vancouver, British Columbia, Canada, June 2011.

Y.C. Chen, S. Soumya, G. Sun, Y. Xie, **S. Datta** and V. Narayanan, "Automated Mapping for Reconfigurable Single Electron Transistor Arrays," Design Automation Conference, June 2011.

V. Saripalli, A. Misra, **S. Datta,** and V. Narayanan, "An Energy-Efficient Heterogeneous CMP based on Hybrid TFET-CMOS Cores," Design Automation Conference, June 2011.

L. Liu, V. Saripalli, E. Hwang, V. Narayanan, and **S. Datta**, "Multi-Gate Modulation Doped In0.7Ga0.3As Quantum Well FET for Ultra Low Power Digital Logic," 219th Electro chemical Society Meeting, May 2011.

C. D. Young, M. Baykan, A. Agrawal, H. Madan, K. Akarvardar, C. Hobbs, I. OK, W. Taylor, C. E. Smith, M. M. Hussain, T. Nishida, S. Thompson, P. Majhi, P. Kirsch, **S. Datta,** and R. Jammy, "Critical Discussion on (100) and (110) Orientation Dependent Transport : nMOS Planar and FinFET", International Symposium on VLSI Technology, June 2011.

H. Madan, D. Veksler, Y.T. Chen, J. Huang, N. Goel, G. Bersuker, and **S. Datta**, "Interface States at high-k/InGaAs interface: H2O vs. O3 based ALD Dielectric," Device Research Conference, June 2011.

L. Liu, V. Saripalli, V. Narayanan and **S. Datta**, "Experimental Investigation of Scalability and Transport in In0.7Ga0.3As Multi-Gate Quantum Well FET (MuQFET)," Device Research Conference, June 2011.

R. Bijesh, I. OK, M. Baykan, C. Hobbs, P.Majhi, R.Jammy and **S.Datta**, "Hole Mobility Enhancement in Uniaxially Strained SiGe FINFETs: Analysis and Prospects," Device Research Conference, June 2011.

A. Agrawal, A. Ali, R. Misra, P. E. Schiffer, B. R. Bennett, J. B. Boos and **S. Datta**, "Experimental Determination of Dominant Scattering Mechanisms in Scaled InAsSb Quantum Well," Device Research Conference, June 2011.

A. Agrawal, A. Ali, R. Misra, P. E. Schiffer, J. B. Boos, B. R. Bennett and **S. Datta**, "Low Field Electron Transport in Mixed Arsenide Antimonide Quantum Well Heterostructures," Electronic Materials Conference, June 2011.

V. Saripalli, J. P. Kulkarni, N. Vijaykrishnan and **S. Datta**, "Variation-Tolerant Ultra Low- Power Heterojunction Tunnel FET SRAM Design," IEEE/ACM International Symposium on Nanoscale Architectures, July 2011.

L. Liu, V. Saripalli, V. Narayanan and **S. Datta**, "Device Circuit Co-Design Using Classical and Non-Classical III-V Multi-Gate Quantum-Well FETs (MuQFETs)," IEEE International Electron Devices Meeting , December 2011.

A. Roy and **J. F. Doherty,** "Weak signal sensing using empirical mode decomposition and stochastic data reordering," IEEE Military Communications Conference, November 2011.

Brett Flood, **William E. Higgins**, and Lav Rai. "System for Robust Bronchoscopic Video
Distortion Correction,'' SPIE Medical Imaging 2011: Visualization, Image-Guided Procedures, and Modeling, February 2011.

Duane C. Cornish and **William E. Higgins**, "Real-time method for bronchoscope motion
measurement and tracking,'' SPIE Medical Imaging 2011: Visualization, Image-Guided
Procedures, February 2011.
Rahul Khare and **William E. Higgins**, "Image-based global registration system for bronchoscopy guidance,'' SPIE Medical Imaging 2011: Visualization, Image-Guided Procedures, and
Modeling, February 2011.

C. Radhakrishnan and **W. K. Jenkins**, “Fault Tolerant Adaptive Filters Based on Modified Discrete Fourier Transform Architectures**,”** [IEEE International Symposium on Circuits and Systems](http://journalseek.net/cgi-bin/journalseek/journalsearch.cgi?field=issn&query=0271-4310), May, 2011.

C. Radhakrishnan and **W. K. Jenkins**, ”The 2-D Modulated Disctrete Fourier Transform for 2-D Fast Convolution and Digital Filtering**,”** [IEEE International Symposium on Circuits and Systems](http://journalseek.net/cgi-bin/journalseek/journalsearch.cgi?field=issn&query=0271-4310), May, 2011.

C. Radhakrishnan and **W. K. Jenkins**, “Reliable transform domain adaptive filters designed with a hybrid combination of redundant hardware modules and algorithmic error detection and correction” [IEEE International Midwest Symposiumon Circuits and Systems](http://www.mwscas.org/), August 2011.

C. Radhakrishnan and **W. K. Jenkins**, “Nested Quadratic Arithmetic for Efficient Convolution of Complex Sequences with Quadratic Modified Fermat Number Transforms,” Forty-Fifth Annual Asilomar Conference on Signals, Systems, and Computers, November 2011.

**M. Kavehrad**, J. Fadlullah, Z. Hajjarian, "MIMO FSO Communications in Cloud and Turbulence," OSA Topical Meeting, July 2011.

**M. Kavehrad**, J. Fadlullah, “Optical Wireless Networked Systems: Applications to Aircrafts,”SPIE Photonics West, January 2011.

A. Kurve, C. Griffin, **G. Kesidis**, “A Graph Partitioning Game for Distributed Simulation of Networks,” International Workshop of Modeling, Analysis, and Control of Complex Networks, September 2011.

B. Celik, J. Raghuram, **G. Kesidis, D.J. Miller,** “Salting Public Traces with Attack Traffic to Test Flow Classifiers,” USENIX Cyber Security Experimentation and Test Workshop, August 2011.

A. Kurve , C. Griffin , **G. Kesidis,**  “Iterative Partitioning Scheme for Distributed Simulation of Dynamic Networks,” Sixteenth IEEE International Workshop on Computer-Aided Modeling Analysis and Design of Communication Links and Networks , June 2011.

A. Kurve, **G. Kesidis**, “Sybil Detection via Distributed Sparse Cut Monitoring,” IEEE International Conference on Communications, June 2011.

C. Griffin, **G. Kesidis**, P. Antoniadis, S. Fdida, “An Epidemic Model of BitTorrent for Acquisition Performance, Content Availability, and Cooperation Incentive,” IEEE International Conference on Communications, June 2011.

**I. C. Khoo**, J. Huang, S. Zhou, J. Liou, K. L. Hong and Yi Ma, “Liquid-crystals-plasmonics for ultrafast broadband all-optical switching,” in Material Research Society, Symposium on Liquid Crystals - Beyond Displays, 2011.

B. Yilmaz, M. Ayazoglu, M. Sznaier and **C. Lagoa**, “Convex Relaxations for Robust Identification of Wiener Systems and Applications,” Joint 50th IEEE Conference on Decision and Control and European Control Conference, 2011.

S. Kadetotad, P. Vemulapalli, S. Brennan and **C. Lagoa**, "Terrain-Aided Localization Using Feature-Based Particle Filtering," 4th Annual Dynamic Systems and Control Conference, 2011.

Chao Feng, **Constantino M. Lagoa**, Mario Sznaier, "Identifying Stable Fixed Order Systems from Time and Frequency Response Data,” American Control Conference, 2011.

**J.-W. Lee** and G. E. Dullerud, “Joint synthesis of switching and feedback for linear systems in discrete time,” 14th ACM International Conference on Hybrid Systems: Computation and Control, 2011.

S. Ghosh and **J.-W. Lee,** “Optimal synthesis for finite-time consensus under fixed graphs,” 50th IEEE Conference on Decision and Control, 2011.

S. Mirzazad-Barijough and **J.-W. Lee**, “Finite-state simulations and bisimulations for discrete-time piecewise affine systems,” 50th IEEE Conference on Decision and Control, 2011.

J. Ouyang, C. Yang, D. Niu, Y. Xie, and **Z. Liu,** "F2BFLY: an on-chip free-space optical network with wavelength-switching," International Conference on Supercomputing, 2011.

**J. D. Mathews**, “Underdense, overdense, and Bragg scattering in radar meteors,” URSI General Assembly and Scientific Symposium of the International Union of Radio Science, August 2011.

I. Seker, W. E. Swartz**, J. D. Mathews**, and N. Aponte, “A new 3D display format relating azimuth-scanning radar data and all-sky images,” URSI General Assembly and Scientific Symposium of the International Union of Radio Science, August 2011.

 J. H. Klenzing, I. Seker, R. F. Pfaff, D. E. Rowland, S. F. Fung, and **J. D. Mathews**, “Multi-Instrument Observations of an MSTID over Arecibo Observatory,” URSI General Assembly and Scientific Symposium of the International Union of Radio Science, August 2011.

**T. S. Mayer**, J. Kim, B. Won, M. Li, T. Morrow, W. Hu, S. Dean, H. Liu, A. Vallett, C. D. Keating, and **J. S. Mayer**, “Adding New Capabilities to Si CMOS Via Deterministic Nanowire Assembly,” Electrochemical Society Transactions, October 2011.

D. K. Mohata, R. Bijesh , S. Mujumdar, C. Eaton, R. Engel-Herbert, **T. Mayer**, V. Narayanan, J. Fastenau, D. Loubychev, A. Liu and **S. Datta**, "Demonstration of MOSFET-Like On-Current Performance in Arsenide/Antimonide Tunnel FETs with Staggered Hetero-junctions for 300mV Logic Applications", IEEE International Electron Devices Meeting, December 2011.

D. K. Mohata, R. Bijesh, V. Saripalli, **T. S. Mayer, S. Datta**, “Self-Aligned Gate Nanopillar In0.53Ga0.47As Vertical Tunnel Transistors,” 69th Device Research Conference, June 2011.

F. Namin, S. Yun, **T. S. Mayer, D. H. Werner,** C. Rivero-Baleine, “Near-Perfect Optical Mirrors Based on Thin All-Dielectric Zero Index Metamaterial Coatings,” IEEE AP-S International Symposium and USNC/URSI National Radio Science Meeting, July 2011.

U. Srinivas, **V. Monga** and R. Raj, "Meta-classifiers for exploiting feature dependencies in automatic target recognition", IEEE International Radar Conference, May 2011.

D. Vats, **V. Monga**, U. Srinivas, and J. Moura, "Scalable Robust Hypothesis Tests Using Graphical Models" IEEE International Conference on Acoustics, Speech and Signal Processing, May 2011.

U. Srinivas, **V. Monga** and R. Raj, “Automatic Target Recognition Using Discriminative Graphical Models", IEEE International Conference on Image Processing, September 2011.

M. Li, **V. Monga**, "Desynchronization Resilient Video Fingerprinting via Randomized, Low-rank Tensor Approximations," IEEE International Workshop on Multimedia Signal Processing, October 2011.

U. Srinivas, X. Mo, M. Parmar and **V. Monga**, "Image-adaptive color super-resolution," IS&T/SID 19th Color Imaging Conference, November 2011.

U. Srinivas, **V. Monga**, Y.Chen and T. D. Tran, "Sparsity-based face recognition using discriminative graphical models," IEEE Asilomar Conference on Signals, Systems and Computers, November 2011.

C. Fillion, Z. Fan and **V. Monga**, "Adaptive removal of background and white space from document images using seam categorization," SPIE Electronic Imaging, January 2011.

M.S. Huang and **R.M. Narayanan**, "Non-Cooperative Collision Avoidance Concept for Unmanned Aircraft System using Satellite-Based Radar and Radio Communication," 30th Digital Avionics Systems Conference, October 2011.

J.J. Zhang, S. Bhat, Q. Ding, A. Papandreou-Suppappola, **R.M. Narayanan**, S. Kay, and M. Rangaswamy, "Design and Performance of an Integrated Waveform-Agile Multi-Modal Track-Before-Detect Sensing System," 45th Annual Asilomar Conference on Signals, Systems, and Computers, November 2011.

**R.M. Narayanan**, "Earthquake Survivor Detection using Life Signals from Radar Micro-Doppler," International Conference on Wireless Technologies for Humanitarian Relief, December 2011.

R. Vela, G. Woodington, M.R. Deluca, and **Ram M. Narayanan**, "Direct Digitization of Ultra-Wideband (UWB) Noise Signals using Frequency Band Folding," SPIE Conference on Radar Sensor Technology XV, April 2011.

R. Vela, D. Erisman, and **R.M. Narayanan**, "A Technique for the Generation of Customizable Ultra-Wideband Pseudo-Noise Waveforms," SPIE Conference on Radar Sensor Technology XV, April 2011.

R. Vela, **R.M. Narayanan**, and D. Erisman, "A Technique for the Extraction of Ultra-Wideband (UWB) Signals Concealed in Frequency Band Folded Responses," SPIE Conference on Radar Sensor Technology XV, April 2011.

G. Woodington, M. DeLuca, R. Moro, D. Lemus, R. Vela, and **R.M. Narayanan**, "Target Discrimination Technique Utilizing Noise Waveforms," SPIE Conference on Radar Sensor Technology XV, April 2011.

D.P. Fairchild and **R.M. Narayanan**, "Human Activity Classification using Hilbert-Huang Transform Analysis of Radar Doppler Data," SPIE Conference on Radar Sensor Technology XV, April 2011.

S. Smith and **R.M. Narayanan,** "Cross-Correlation Analysis of Noise Radar Signals Propagating through Lossy Dispersive Media," SPIE Conference on Radar Sensor Technology XV, April 2011.

**R.M. Narayanan**, "Advances in Noise and Chaotic Radar," International Radar Symposium India December 2011.

**R.M. Narayanan**, "Human Detection and Characterisation Through Barriers," International Conference on Wireless Technologies for Humanitarian Relief, December 2011.

**R.M. Narayanan**, "Radar Tags for Communications and Information Transfer," International Radar Symposium India, December 2011.

S. Celestin, and **V. P. Pasko**, “Physical processes in lightning leaders producing high energy electrons,” 14th International Conference on Atmospheric Electricity August 2011.

**V. P. Pasko**, “Electrostatic mechanism of lightning associated infrasonic pulses from thunderclouds,” 14th International Conference on Atmospheric Electricity, August 2011.

A. Kshirsagar, S. Pickering, J. Xu, and **J. Ruzyllo,** "Light Emitting Diodes Formed Using Mist Deposition of Colloidal Solution of CdSe Nanocrystalline Quantum Dots", ECS Spring Meeting, May 2011.

F. Li, Z. Fang, R. Misra, **S. Tadigadapa, Q. Zhang** and **S. Datta**, "Giant magnetoelectric effect in nanofabricated Pb(Zr0.52Ti0.48)O3-Fe85B5Si10 Cantilevers and resonant gate transistors", Device Research Conference, June 2011.

Ping Kao, David Allara, **Srinivas Tadigadapa**, “Label Free Piezoelectric Dna Sensor Arrays Using Novel Selective Immobilization Techniques,” IEEE MEMS Conference, January 2011.

Ping Kao, David Allara, **Srinivas Tadigadapa,** ‘Label Free Piezoelectric DNA Sensor Arrays Using Novel Selective Immobilization Techniques,” IEEE MEMS Conference, January 2011.

Son Vu Hoang Lai, Ping Kao, **Srinivas Tadigadapa**, “Thermal Biosensors From Micromachined Bulk Acoustic Wave Resonators,” Eurosensors XXV, September 2011.

Hwall Min, David Allara, **Srinivas Tadigadapa**, “Investigation Of The Viscoelastic Properties Of Liquids Trapped In Nanoporous Cavities Using Micromachined Acoustic Transducers,” Eurosensors XXV, September 2011.

Hwall Min, Nichole Sullivan, David Allara, **Srinivas Tadigadapa**, “Nanoporous Gold: A High Sensitivity And Specificity Biosensing Substrate,” Eurosensors XXV, September 2011.

**J. Urbina**, R. Seal, and L. Dyrud, “The New Meteor Radar at Penn State: An Approach for Open Source Software Defined Radar for Aeronomy,” XXX URSI General Assembly and Scientific Symposium of International Union of Radio Science Meeting, August 2011.

F. Galindo, **J. Urbina**, J. Chau, and L. Dyrud, “On the effect of the signal processing in the meteor-head data at Jicamarca,” XXX URSI General Assembly and Scientific Symposium of International Union of Radio Science Meeting, August 2011.

Z. H. Jiang, S. Yun, F. Toor, **D. H. Werner, T. S. Mayer**, “Experimental Demonstration of a Conformal Optical Metamaterial Absorber,” IEEE AP-S International Symposium and USNC/URSI National Radio Science Meeting, July 2011.

Z. H. Jiang, S. Yun, Q. Xu, **D. H. Werner, Z. Liu, T. S. Mayer**, “Experimental Verification of a Zero-Index Near Infrared Metamaterial,” IEEE AP-S International Symposium and USNC/URSI National Radio Science Meeting, July 2011.

Kaya Tutuncuoglu and **Aylin Yener**, “Transmission Policies for Asymmetric Interference Channels with Energy Harvesting Nodes,” International Workshop on Computational Advances in Multi-Sensor Adaptive Processing, December 2011.

Basak Guler and **Aylin Yener**, “Interference Alignment for Cooperative MIMO Femtocell Networks,” IEEE Global Telecommunications Conference, December 2011.

Xiang He, Ashish Khisti and **Aylin Yener**, “MIMO Broadcast Channel with Arbitrarily Varying Eavesdropper Channel: Secrecy Degrees of Freedom,” IEEE Global Telecommunications Conference, December 2011.

Xiang He and **Aylin Yener**, “Gaussian Two-way Wiretap Channel with an Arbitrarily Varying Eavesdropper,” IEEE Global Telecommunications Conference Workshop on Physical Layer Security, December 2011.

Scott T. Rager, Ertugrul N. Ciftcioglu, **Aylin Yener**, Thomas F. La Porta, and Michael J. Neely, “Distributed Backpressure Protocols with Limited State Feedback,” IEEE Military Communications Conference, November 2011.

Ertugrul N. Ciftcioglu and **Aylin Yener**, “Quality-of-Information Aware Transmission Policies with Time-Varying Links,” IEEE Military Communications Conference, November 2011.

Ye Tian and **Aylin Yener**, “Relaying for Multiple Sources in the Absence of Codebook Information,” Asilomar Conference on Signals, Systems, and Computers, November 2011.

Kaya Tutuncuoglu and **Aylin Yener**, “Optimal Power Control for Energy Harvesting Transmitters in an Interference Channel,” Asilomar Conference on Signals, Systems, and Computers, November 2011.

Xiang He, Ashish Khisti and **Aylin Yener**, “MIMO Multiple Access Channel with an Arbitrarily Varying Eavesdropper,” 49th Annual Allerton Conference on Communication, Control, and Computing, September 2011.

**Aylin Yener** and Igor Stanojev, “Recruiting Multi-Antenna Transmitters as Cooperative Jammers: An Auction-Theoretic Approach,” 49th Annual Allerton Conference on Communication, Control, and Computing, September 2011.

Xiang He and **Aylin Yener**, “Secrecy When the Eavesdropper Controls its Channel States,” IEEE International Symposium on Information Theory, July 2011.

Min Li, Osvaldo Simeone and **Aylin Yener**, “Leveraging Strictly Causal State Information at the Encoders for Multiple Access Channels,” IEEE International Symposium on Information Theory, July 2011.

Ertugrul N. Ciftcioglu, **Aylin Yener**, Ramesh Govindan, and Konstantinos Psounis, “Operational Information Content Sum Capacity: Formulation and Examples,” ISIF International Conference on Information Fusion, July 2011.

Forrest Iandola, Latemeh Saremi, Tarek Abdelzaher, Praveen Jayachandran and **Aylin Yener**, “Real-Time Capacity of Networked Data Fusion,” ISIF International Conference on Information Fusion, July 2011.

Ye Tian and **Aylin Yener**, “Harnessing Interference with an Out-of-Band Relay: an Approximate Capacity Result,Proceedings of the IEEE International Conference on Communications, ICC'11, Kyoto, Japan, June 2011.

Kaya Tutuncuoglu and **Aylin Yener**, “Short-Term Throughput Maximization for Battery Limited Energy Harvesting Nodes,” IEEE International Conference on Communicationsn, June 2011.

Igor Stanojev and **Aylin Yener**, “Cooperative Jamming via Spectrum Leasing,” 2011 International Symposium of Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks, May 2011.

Rahul Urgaonkar, Ertugrul N. Ciftcioglu, **Aylin Yener**, and Michael J. Neely, “Quality of Information Aware Scheduling in Task Processing Networks,” 7th International Workshop on Resource Allocation and Cooperation in Wireless Networks, May 2011.

Omur Ozel, Kaya Tutuncuoglu, Jing Yang, Sennur Ulukus, and **Aylin Yener**, “Resource Management for Fading Wireless Channels with Energy Harvesting Nodes,” IEEE International Conference on Computer Communications - Mini Conference, April 2011.

Omur Ozel, Kaya Tutuncuoglu, Jing Yang, Sennur Ulukus, and **Aylin Yener**, “Adaptive Transmission Policies for Energy Harvesting Wireless Nodes in Fading Channels,” Conference of Information Sciences and Systems, March 2011.

A. Bar-Noy, G. Cirincione, R. Govindan, S. Krishnamurthy, T. F. LaPorta, P. Mohapatra, M. Neely, and **A. Yener**, “Quality-of-Information Aware Networking for Tactical Military Networks,” Third International Workshop on Information Quality and Quality of Service for Pervasive Computing, March 2011.

Min Li, Osvaldo Simeone and **Aylin Yener**, “Message and State Cooperation in a Relay Channel When the Relay Has Strictly Causal State Information,” Information Theory and Applications Workshop, February 2011.

G. Xiong, C. Chen, S. Kishore and **A. Yener**, “Smart (In-home) Power Scheduling for Demand Response on the Smart Grid,” IEEE Power and Energy Society Conference on Innovative Smart Grid Technologies, January 2011.

 J. Yao, T. Li, Y. Gao, Q. Li, and **S. Yin**, "Growth and characterization of ZnO/MgZnO composite structures grown by pulsed laser deposition,"International Society for Optics and Photonics, 2011.

C. Wang, Y. Chang, J. Yao, C. Luo, **S. Yin,** P. Ruffin, C. Brantley, and E. Edwards, "Nanostructures created by interfered femtosecond laser," International Society for Optics and Photonics, 2011.

Y. Gao, J. Yao, and **S. Yin,** "Terahertz wave generation with multi-physics mechanisms," International Society for Optics and Photonics, 2011.

Y. Chang, **S. Yin,** C. Wang, and C. Luo, "Electrically and mechanically tunable photonic metamaterials," International Society for Optics and Photonics, 2011.

**S. Yin,** P. Ruffin, C. Brantley, and E. Edwards, "High efficiency IR supercontinuum generation and applications: a review," International Society for Optics and Photonics, 2011.

T. Levard, P. J. Diglio, S. G. Lu, L. J. Gorny, C. D. Rahn, and **Q. M. Zhang**, “PVDF Core-free actuators for Braille displays: design, fabrication process and testing,” International Society for Optics and Photonics, 2011.

S. G. Lu, X. Y. Li, J. P. Cheng, L. Gorny and **Q. M. Zhang**, “Giant Electrocaloric Effect in High-Energy Electron Irradiated P(VDF-TrFE) Copolymers,” Materials Research Society Symposium, 2011.

Shan Wu, Minren Lin, David S-G. Lu and **Qiming Zhang**, “Polar-fluoropolymer Blends for High Energy Density Low Loss Capacitor Applications, Polymer-Based Materials and Composites-Sythesis, Assembly and Applications,” Materials Research Society Symposium, 2011.

Gokhan Hatipoglu, Yang Liu, Dean Tigelaar, Mitra Yoonessi, **Qiming Zhang, Srinivas Tadigadapa**, “Fabrication And Electromechanical Performance Of A Novel High Modulus Ionogel Micro-Actuator,” Eurosensors XXV, September 2011.

**D.** **Papers Refereed by Abstract**
***Listed by author, title, meeting, and date***

Andras Gordon, Kathryn W. Joblokow, and **Sven G. Bilén**, "Bringing the Systems Approach to Introductory Engineering Design," 2011 Middle Atlantic Regional Conference, April 2011.

Christopher N. Davis, Peter Y. Peterson, and **Sven G. Bilén**, "Communication through Hypersonic or Re-Entry Plasmas," 49th AIAA Aerospace Sciences Meeting including the New Horizons Forum and Aerospace Exposition, January 2011.

Christopher N. Davis, Peter Y. Peterson, and **Sven G. Bilén**, "Hypersonic or Re-Entry Plasma Communication," 17th AIAA International Space Planes and Hypersonic Systems and Technologies Conference, April 2011.

Allen T. Kummer, Erik D. Weir, Trey J. Morris, Corey W. Friedenberger, Aseem Singh, Robert M. Capuro, **Sven G. Bilén**, Johnny Fu, Gregory T. Swanson, and David B. Hash, "Testing of a Wireless Sensor System for Instrumented Thermal Protection Systems," 17th AIAA International Space Planes and Hypersonic Systems and Technologies Conference, April 2011.

Jesse K. McTernan, **Sven G. Bilén**, "Development of a Modeling Capability for Energy Harvesting Modules in Electrodynamic Tether Systems," AIAA SPACE 2011 Conference & Exposition, September 2011.

Iverson C. Bell, Brian E. Gilchrist, Jesse K. McTernan, **Sven G. Bilén**, Robert P. Hoyt, Nestor R. Voronka, Mason A. Peck, "Enabling Ultra-small Sensor Spacecraft for the Space Environment using Small-Scale Electrodynamic Tethers," AIAA SPACE 2011 Conference & Exposition, September 2011.

Erica E. Capalungan, Michael M. Micci, and **Sven G. Bilén**, "The Design and Development of a 30-GHz Microwave Electrothermal Thruster," 32nd International Electric Propulsion Conference, September, 2011.

Daniel P. Lubey, **Sven G. Bilén**, Michael M. Micci, and Pierre-Yves Taunay, "Design of the Miniature Microwave-Frequency Ion Thruster," 32nd International Electric Propulsion Conference, September, 2011.

**Sven G.Bilén**, Jesse K. McTernan, Brian E. Gilchrist, Iverson C. Bell, Robert P. Hoyt, and Nestor R. Voronka, "Harnessing the 'Orbital Battery' for Propulsion via Energy-Harvesting Electrodynamic Tethers," 32nd International Electric Propulsion Conference, September, 2011.

Iverson C. Bell, Brian E. Gilchrist, Jesse K. McTernan, **Sven G., Bilén**, Robert P. Hoyt, Nestor R. Voronka, and Mason A. Peck, "The Potential of Miniature Electrodynamic Tethers to Enhance Capabilities of Femtosatellites," 32nd International Electric Propulsion Conference, September, 2011.

Okhtay Azarmanesh and **Sven G. Bilén**, "Novel Modulation Classification Technique for Multi-Carrier and Single-Carrier Signals in Cognitive Radio Applications," 2011 Tactical Communications and Interoperability Conference, June 2011.

Allen T. Kummer and **Sven G. Bilén**, "The Role of Suborbital Flights for Education and Technology Development within Penn State's Student Space Programs Laboratory," 2011 Next-Generation Suborbital Researchers Conference, February 2011.

**W.E. Higgins**, K. Lu, R. Bascom, and R.P.M. Mahraj, "Automatic Lymph-Node Station Definition
in 3D MDCT Images," American Thoracic Society 2011, American Journal of Respiratory and Critical Care Medicine, May 2011.

**W.E. Higgins**, K. Lu, R. Bascom, R.P.M. Mahraj, D. Campbell, and J. Toth, "Toward Exhaustive
Identification of the Central-Chest Lymph Nodes in 3D MDCT Scans," American Thoracic Society (ATS) 2011, American Journal of Respiratory and Critical Care Medicine, May 2011.

**T. J. Jackson**, “Oxide Semiconductor Thin Film Transistor Material and Device Understanding,” Materials Research Society Fall Meeting, November 2011.

**T. J. Jackson**, “Weak Reactant Plasma Enhanced Atomic Layer Deposition ZnO Thin Film Transistors for Large Area and Flexible Substrate Applications,” Materials Research Society Fall Meeting, November 2011.

J. I. Ramirez, Y. V. Li, D. A. Zhao, and **T. N. Jackson**, “ZnO Thin Film Transistors by Low Temperature Deposition Plasma-Enhanced Atomic Layer Deposition in a Showerhead Reactor,” International Semiconductor Device Research Symposium, December 2011.

Y. V. Li, J. I. Ramirez, H. U. Li, and **T. N. Jackson**, “Low-Temperature PEALD ZnO Double-Gate TFTs,” International Semiconductor Device Research Symposium, December 2011.

B. D. Gauntt, J. Li, O. M. Cabarcos, H. A. Basantani, C. Venkatasubramanian, S. Bharadwaja, N. J. Podraza, **T. N. Jackson,** D. L. Allara, S. Antrazi, M. W. Hor, and E. C. Dickey, “Microstructure of Vanadium Oxide Used in Microbolometers,” SPIE, Infrared Technology and Applications, April 2011.

H. B. Shin, D. B. Saint John, M. Y. Lee, N. J. Podraza, and **T. N. Jackson**, “Hydrogenated Amorphous Silicon-Carbon Alloy Thin Films for Uncooled Microbolometers,” Electronic Materials Conference, June 2011.

Y. V. Li, J. I. Ramirez, and **T. N. Jackson**, “ZnO and Al2O3 Thin Films Deposited by Plasma Enhanced Atomic Layer Deposition and Plasma Enhanced Chemical Vapor Deposition,” Electronic Materials Conference, June 2011.

D. B. Saint John, H. B. Shin, M. Y. Lee, E. C. Dickey, N. J. Podraza, and **T. N. Jackson**, “Thin Film Silicon and Germanium for Uncooled Microbolometer Applications,” SPIE, Infrared Technology and Applications XXXVII, April 2011.

M. D. Zhou, C. Yang, **Z. Liu,** J. P. Cysyk, S. Y. Zheng, “A Fabry-Pérot pressure sensor fabricated on left ventricular assist device for heart failure implant,” 16th International Conference on Solid-State Sensors, Actuators and Microsystems, June 2011.

Y. A. Yuwen, W. Hu, S. Yun, **T. S. Mayer**, M. Krishnamurthy, K. G. Eyink, “Self-Organized Freestanding One-Dimensional Gold Nanoparticle Arrays,” Material Research Society Fall Meeting, November 2011.

**T. S. Mayer**, J. Kim, B. Won, M. Li, T. Morrow, W. Hu, S. Dean, H. Liu, A. Vallett, C. D. Keating, and **J. S. Mayer**, “Adding New Capabilities to Si CMOS Via Deterministic Nanowire Assembly,” American Vacuum Society Annual Meeting, November 2011.

K. L. Liddell, X. Zhong, K. Sun, S. L. Dean, **T. S. Mayer**, and C. D. Keating, “Fabrication and Characterization of Phosphonic Acid Monolayers for Use in Biosensing,” 241st National Meeting and Exposition of the American-Chemical-Society, March 2011.

M.C. Shastry and **R.M. Narayanan**, "Performance of Basis Pursuit Denoising Algorithms for Compressive Sensing Applications Involving Partial Toeplitz Random Matrices," February Fourier Talks, February 2011.

Y. Kwon and **R.M. Narayanan,** "Detection Performance of Distributed Radar Systems using Compressive Sensing," February Fourier Talks, February 2011.

**R.M. Narayanan** and S.C. Small, "National Small Arms Center Educational Initiative," NDIA International Infantry & Joint Services Small Arms Systems Symposium, Exhibition & Firing Demonstration, May 2011.

**R.M. Narayanan**, "Wireless Technologies for Enhancing Small Arms Effectiveness," NDIA International Infantry & Joint Services Small Arms Systems Symposium, Exhibition & Firing Demonstration, May 2011.

**R.M. Narayanan**, "Advances in Noise Radar: Tomographic Imaging and Target-Matched Adaptive Illumination," AFOSR Sensing, Surveillance, and Navigation Workshop, June 2011.

S. Celestin, and **V. P. Pasko**, “Physical processes in lightning leaders producing high energy electrons,” 14th International Conference on Atmospheric Electricity, August, 2011.

S. J. Celestin , W. Xu, and **V. P. Pasko**, “Terrestrial gamma-ray flashes produced by energetic electrons during the stepping of lightning leaders,” Fall Meeting, American Geophysical Union, December 2011.

W. A. Lyons, S. A. Cummer, T. Samaras, T. J. Lang, P. R. Krehbiel, W. L. Beasley, **V. P. Pasko**, and E. W. McCaul, “Transient luminous events and storms which produce them,” National Radio Science Meeting, January 2011.

S. Mallios and **V. P. Pasko**, “Charge transfer to the ionosphere and to the ground during thunderstorms,” Fall Meeting, American Geophysical Union, December 2011.

**V.P. Pasko** and M. Fullekrug, “Waveforms of nighttime atmospherics as a measure of the lower ionospheric electron density profiles over UK and France on August 31, 2008,” National Radio Science Meeting, January 2011.

**V. P. Pasko,** “Finite-difference time-domain modeling of infrasonic waves generated by supersonic auroral arcs,” CEDAR-GEM Joint Workshop, June -July 2011.

**V. P. Pasko,** “Lightning-related transient luminous events at high altitude in the Earth’s atmosphere,” Symposium on Space Plasmas, Brazilian Physics Meeting, June 2011.

**V. P. Pasko**, “Electrostatic mechanism of lightning associated infrasonic pulses from thunderclouds,” 14th International Conference on Atmospheric Electricity, August 2011.

**V.P. Pasko** and M. Fullekrug, “Waveforms of nighttime atmospherics as a measure of the lower ionospheric electron density profiles over UK and France on August 31, 2008,” 30th URSI General Assembly and Scientific Symposium of International Union of Radio Science, August 2011.

**V. P. Pasko**, “Numerical modeling of initiation of lightning leaders from tall structures by sprite producing lightning discharges,” Fall Meeting, American Geophysical Union, December 2011.

J. Qin, S. J. Celestin, and **V. P. Pasko**, “Impact of mesospheric ion conductivity variations on the initiation of long delayed sprites,” CEDAR-GEM Joint Workshop, June -July 2011.

J. Qin, S. J. Celestin, **V. P. Pasko**, J. Li, and S. A. Cummer, “Impact of successive lightning strokes on the initiation and propagation of sprite streamers,” Fall Meeting, American Geophysical Union, December 2011.

J. A. Riousset, **V. P. Pasko**, and A. Bourdon, “Air-density-dependent model for analysis of air heating associated with streamers, leaders, and transient luminous events,” CEDAR-GEM Joint Workshop, June -July 2011.

W. Xu, S. J. Celestin, and **V. P. Pasko**, “Monte Carlo simulation of terrestrial gamma-ray flashes,” CEDAR-GEM Joint Workshop, June -July 2011.

W. Xu, S. J. Celestin, and **V. P. Pasko**, “Estimation of source altitudes of terrestrial gamma-ray flashes produced during the stepping of lightning leaders,” Fall Meeting, American Geophysical Union, December 2011.

**J. Urbina**, L. Dyrud, Freddy Galindo, and Ryan Seal, “Observations, Validation and Calibration of the Penn State Meteor Radar,” URSI National Radio Science Meeting, January 2011.

F. R. Galindo, **J. Urbina**, J. L. Chau, and L. P. Dyrud, “On the Possible Effect of Signal Processing on Meteor-Head Data from Jicamarca,” URSI National Radio Science Meeting, January 2011.

L. P. Dyrud, **J. Urbina**, and F. Galindo, “Plasma Turbulence effects on specular trail observations,” URSI National Radio Science Meeting, January 2011.

Z. H. Jiang, S. Yun, Q. Xu, **D. H. Werner, Z. Liu**, and **T. S. Mayer**, "Experimental verification of a zero-index near-infrared metamaterial," IEEE International Symposium on Antennas and Propagation 2011.

## E. Book or Book Chapter*Listed by author, year, title, and publisher*

**M. Kavehrad**, 2011. “Equalization and Markov Chains in Cloud Channel,” in *Advanced Optical Wireless Communication Systems*, Cambridge University Press.

**G. Kesidis,** 2011. *An Introduction to Models of Online Peer-to-Peer Social Networking*, Morgan & Claypool.

**G. Kesidis**, 2011. “Denial-of-Service Defense” in the *Encyclopedia of Cryptography and Security*, 2nd Edition. Springer, Berlin.

A. Diaz and **I. C. Khoo**, 2011. “Liquid crystalline nano-structured optical metamaterials,” in *Comprehensive Nanoscience and Technology*, Vol. 3, Elseier.

C. Feng, N. Ozay, **C. M. Lagoa** and M. Sznaier, 2011. “Identification and Model (In)validation of Switched ARX Systems: Moment-Based Approaches,” in *Linear Parameter-Varying System Identification: New Developments and Trends*, World Scientific.

Y. Wang, H. Li, **D.J. Miller**, and J. Xuan, 2011."Bioinformatics and Public Access," in *Genetic and Molecular Aspects of Sports Performance*, Wiley-Blackwell.

W. Yu, X. Yang, Y. Liu, **R. Mittra**, A. Muto, 2011. *Advanced FDTD method: Parallelization, acceleration, and engineering applications*, Artech House.

**D.H. Werner**, M. D. Gregory, F. D. Namin, J. S. Petko, and T. G. Spence, 2011. "Ultra-Wideband Antenna Arrays," in *Frontiers in Antennas*, McGraw Hill.

David S-G. Lu, **Q. M. Zhang**, Z. Kutnjak *,* 2011.“The Electrocaloric Effect in Ferroelectric Polymer Films,” in *Thin Film Growth: Physics, Materials Science, and Applications* Woodhead Publishing Ltd.

## ****F. Papers Presented at Technical and Professional Meetings*Listed by author, title, meeting, location, and date*****

G. Botta, **K. Aydin**, J. Verlinde, “Evaluation Of Electromagnetic Scattering Modeling Techniques For Irregular Ice Hydrometeors**,**” 35th  Conf. On Radar Meteorology, Pittsburg, PA, September 2011.

G. Yu, J. Verlinde, E. E. Clothiaux, G. Botta, **K. Aydin**, A. Avramov, A. S. Ackerman, and A. M. Fridlind, “A method for extraction of cloud microphysical properties using a continuous wavelet transform of cloud radar spectra: Preliminary results,” 35th  Conf. On Radar Meteorology, Pittsburg, PA, September 2011.

Y.C. Chen, S. Soumya, G. Sun, Y. Xie, **S. Datta** and V. Narayanan, "Automated Mapping for Reconfigurable Single Electron Transistor Arrays," Design Automation Conference, San Diego, CA, June 2011

V. Saripalli, A. Misra, **S. Datta** and V. Narayanan, "An Energy-Efficient Heterogeneous CMP based on Hybrid TFET-CMOS Cores," Design Automation Conference, San Diego, CA, June 2011.

L. Liu, V. Saripalli, E. Hwang, V. Narayanan and **S. Datta**, "Multi-Gate Modulation Doped In0.7Ga0.3As Quantum Well FET for Ultra Low Power Digital Logic", 219th Electro chemical Society Meeting, Montreal, Canada, May 2011.

H. Madan, D. Veksler, Y.T. Chen, J. Huang, N. Goel, G. Bersuker and **S. Datta**, "Interface States at high-k/InGaAs interface: H2O vs. O3 based ALD Dielectric", Device Research Conference), Santa Barbara, CA, June 2011.

L. Liu, V. Saripalli, V. Narayanan and **S. Datta**, "Experimental Investigation of Scalability and Transport in In0.7Ga0.3As Multi-Gate Quantum Well FET (MuQFET)", Device Research Conference), Santa Barbara, CA, June 2011.

R. Bijesh, I. OK, M. Baykan, C. Hobbs, P.Majhi, R.Jammy and **S.Datta**, "Hole Mobility Enhancement in Uniaxially Strained SiGe FINFETs: Analysis and Prospects", Device Research Conference Santa Barbara, CA, June 2011.

A. Agrawal, A. Ali, R. Misra, P. E. Schiffer, B. R. Bennett, J. B. Boos and **S. Datta**, "Experimental Determination of Dominant Scattering Mechanisms in Scaled InAsSb Quantum Well," Device Research Conference, Santa Barbara, CA, June 2011.

A. Agrawal, A. Ali, R. Misra, P. E. Schiffer, J. B. Boos, B. R. Bennett and **S. Datta**, "Low Field Electron Transport in Mixed Arsenide Antimonide Quantum Well Heterostructures", Electronic Materials Conference, Santa Barbara, CA, June 2011.

V. Saripalli, J. P. Kulkarni, N. Vijaykrishnan and **S. Datta**, "Variation-Tolerant Ultra Low- Power Heterojunction Tunnel FET SRAM Design" IEEE/ACM International Symposium on Nanoscale Architectures, San Diego, CA, July 2011.

L. Liu, V. Saripalli, V. Narayanan and **S. Datta,** "Device Circuit Co-Design Using Classical and Non-Classical III-V Multi-Gate Quantum-Well FETs (MuQFETs)," IEEE International Electron Devices Meeting , Washington D.C., December 2011.

E.C. Hwang, C. Eaton, S. Mujumdar, H. madan, A. Ali, D. Bhatija, **S. Datta**, and **J. Ruzyllo,** "Processing and Characterization of GaSb/High-k Dielectric Interfacees", The Electrochemical Society Meeting, Boston, MA, October 2011.

A. Roy and **J. F. Doherty**, "Weak signal sensing using empirical mode decomposition and stochastic data reordering," IEEE Military Communications Conference, pp.37-41, Baltimore, MD, 7-10 Nov. 2011.

**W.E. Higgins**, K. Lu, R. Bascom, and R.P.M. Mahraj, “Automatic Lymph-Node Station Definition in 3D MDCT Images," American Thoracic Society, Denver, CO, May 2011.

Brett Flood, **William E. Higgins**, and Lav Rai, “`System for Robust Bronchoscopic Video Distortion Correction,” SPIE Medical Imaging 2011: Visualization, Image-Guided Procedures, and Modeling, Orlando, FL, February 2011.

**W.E. Higgins**, K. Lu, R. Bascom, R.P.M. Mahraj, D. Campbell, and J. Toth, “Toward Exhaustive Identification of the Central-Chest Lymph Nodes in 3D MDCT Scans American Thoracic Society, Denver, CO, May 2011.

Duane C. Cornish and **William E. Higgins**, “`Real-time method for bronchoscope motion measurement and tracking,” SPIE Medical Imaging 2011: Visualization, Image-Guided Procedures, and Modeling, Orlando, FL, February 2011.

Rahul Khare and **William E. Higgins**, “Image-based global registration system for bronchoscopy guidance,” SPIE Medical Imaging 2011: Visualization, Image-Guided Procedures, and Modeling, Orlando, FL, February 2011.

Pinyo Taeprasartsit and **William E. Higgins**, “Robust method for extracting the pulmonary vascular trees from 3D MDCT images,” SPIE Medical Imaging 2011: Image Processing, Orlando, FL, February 2011.

**W.E. Higgins**, K. Lu, R. Bascom, and R.P.M. Mahraj, “Automatic Lymph-Node Station Definition in 3D MDCT Images,” American Thoracic Society, Denver, CO, May 2011.

Brett Flood, **William E. Higgins,** and Lav Rai, “System for Robust Bronchoscopic Video Distortion Correction,” SPIE Medical Imaging 2011: Visualization, Image-Guided Procedures, and Modeling, Orlando, FL, February 2011.

**W.E. Higgins**, K. Lu, R. Bascom, R.P.M. Mahraj, D. Campbell, and J. Toth, “Toward Exhaustive Identification of the Central-Chest Lymph Nodes in 3D MDCT Scans,” American Thoracic Society, Denver, CO, May 2011.

Duane C. Cornish and **William E. Higgins**, “Real-time method for bronchoscope motion measurement and tracking,” SPIE Medical Imaging 2011: Visualization, Image-Guided Procedures, and Modeling, Orlando, FL, February 2011.

Rahul Khare and **William E. Higgins**, “Image-based global registration system for bronchoscopy guidance,” SPIE Medical Imaging 2011: Visualization, Image-Guided Procedures, and Modeling, Orlando, FL, February 2011.

Pinyo Taeprasartsit and **William E. Higgins**, “Robust method for extracting the pulmonary vascular trees from 3D MDCT images,” SPIE Medical Imaging 2011: Image Processing, Orlando, FL, February 2011.

**W.E. Higgins**, K. Lu, R. Bascom, and R.P.M. Mahraj, “Automatic Lymph-Node Station Definition in 3D MDCT Images,” American Thoracic Society, Denver, CO, May 2011.

Brett Flood, **William E. Higgins**, and Lav Rai, “System for Robust Bronchoscopic Video Distortion Correction,” SPIE Medical Imaging 2011: Visualization, Image-Guided Procedures, and Modeling, Orlando, FL, February 2011.

**W.E. Higgins**, K. Lu, R. Bascom, R.P.M. Mahraj, D. Campbell, and J. Toth, “Toward Exhaustive Identification of the Central-Chest Lymph Nodes in 3D MDCT Scans,” American Thoracic Society, Denver, CO, May 2011.

Duane C. Cornish and **William E. Higgins**, “Real-time method for bronchoscope motion measurement and tracking,” SPIE Medical Imaging 2011: Visualization, Image-Guided Procedures, and Modeling, Orlando, FL, February 2011.

Rahul Khare and **William E. Higgins**, “Image-based global registration system for bronchoscopy guidance,” SPIE Medical Imaging 2011: Visualization, Image-Guided Procedures, and Modeling, Orlando, FL, February 2011.

Pinyo Taeprasartsit and **William E. Higgins**, “Robust method for extracting the pulmonary vascular trees from 3D MDCT images,” SPIE Medical Imaging 2011: Image Processing, Orlando, FL, February 2011.

B. D. Gauntt, J. Li, O. M. Cabarcos, H. A. Basantani, C. Venkatasubramanian, S. Bharadwaja, N. J. Podraza, **T. N. Jackson**, D. L. Allara, S. Antrazi, M. W. Hor, and E. C. Dickey, “Microstructure of Vanadium Oxide Used in Microbolometers,” SPIE, Infrared Technology and Applications XXXVII, April 2011.

D. B. Saint John, H. B. Shin, M. Y. Lee, E. C. Dickey, N. J. Podraza, and **T. N. Jackson**, “Thin Film Silicon and Germanium for Uncooled Microbolometer Applications,” SPIE, Infrared Technology and Applications XXXVII, April 2011.

H. B. Shin, D. B. Saint John, M. Y. Lee, N. J. Podraza, **and T. N. Jackson**, “Hydrogenated Amorphous Silicon-Carbon Alloy Thin Films for Uncooled Microbolometers,” 2011 Electronic Materials Conference, Santa Barbara, CA, June 2011.

Y. V. Li, J. I. Ramirez, and **T. N. Jackson**, “ZnO and Al2O3 Thin Films Deposited by Plasma Enhanced Atomic Layer Deposition and Plasma Enhanced Chemical Vapor Deposition,” 2011 Electronic Materials Conference, Santa Barbara, CA, June 2011.

**T. J. Jackson**, “Oxide Semiconductor Thin Film Transistor Material and Device Understanding,” 2011 Materials Research Society Fall Meeting, Boston, MA, November 2011.

**T. J. Jackson**, “Weak Reactant Plasma Enhanced Atomic Layer Deposition ZnO Thin Film Transistors for Large Area and Flexible Substrate Applications,” 2011 Materials Research Society Fall Meeting, Boston, MA, November 2011.

J. I. Ramirez, Y. V. Li, D. A. Zhao, and **T. N. Jackson**, “ZnO Thin Film Transistors by Low Temperature Deposition Plasma-Enhanced Atomic Layer Deposition in a Showerhead Reactor,” 2011 International Semiconductor Device Research Symposium, 978-1-4577-1755-0 (December 2011).

Y. V. Li, J. I. Ramirez, H. U. Li, and **T. N. Jackson**, “Low-Temperature PEALD ZnO Double-Gate TFTs,” 2011 International Semiconductor Device Research Symposium, College Park, MD, December 2011.

**M. Kavehrad**, J. Fadlullah, Z. Hajjarian, "MIMO FSO Communications in Cloud and Turbulence," OSA Topical Meeting, Toronto, Canada, July 2011.

**M. Kavehrad**, J. Fadlullah, “Optical Wireless Networked Systems: Applications to Aircrafts,” SPIE Photonics West, San Francisco, CA, January 2011.

A.Kurve, C. Griffin, **G. Kesidis**, “A Graph Partitioning Game for Distributed Simulation of Networks” International Workshop of Modeling, Analysis, and Control of Complex Networks, San Francisco, CA, September 2011.

B.Celik, J. Raghuram, **G. Kesidis**, **D.J. Miller**, “Salting Public Traces with Attack Traffic to Test Flow Classifiers,” USENIX Cyber Security Experimentation and Test Workshop, San Francisco, CA, August 2011.

A.Kurve, C. Griffin **, G. Kesidis**, “Iterative Partitioning Scheme for Distributed Simulation of Dynamic Networks,” Sixteenth IEEE International Workshop on Computer-Aided Modeling Analysis and Design of Communication Links and Networks, Kyoto, Japan, June 2011.

A.Kurve, **G. Kesidis,** “Sybil Detection via Distributed Sparse Cut Monitoring,” IEEE International Conference on Communications),Kyoto, Japan, June 2011.

C.Griffin, **G. Kesidis**, P. Antoniadis, S. Fdida, “An Epidemic Model of BitTorrent for Acquisition Performance, Content Availability, and Cooperation Incentive,” IEEE International Conference on Communications, Kyoto, Japan, June 2011.

**I. C. Khoo**, “Liquid Crystals Nonlinear Optics CW to Femtoseconds All- Optical Signal Processing,” Conference on Lasers and Electro-Optics, Balitmore, MD, May 2011.

**I. C. Khoo, “**Liquid-Crystals-Plasmonic Metamaterials for High Speed All-Optical Processing,” International Metamaterials Workshop, Hangzhou, China, April 2011.

**I. C. Khoo**, “Liquid-crystals-plasmonic optical materials for high speed electro- and nonlinear-optics,” 10th Mediterranean School and International Topical Meeting on Novel Optical Materials and Applications, Cetraro, Italy, June 2011.

**I. C. Khoo,** “Review of Electronics and non-electronics optical nonlinearities of liquid crystals,” Advanced School on Liquid crystals Photonics, Erice, Italy, July 2011.

Grzegorz Pawlik, Wlodzimierz Salejda, Karol Tarnowski, Wiktor T. Walasik, Antoni C. Mitus **and I. C. Khoo**, “Toward cloaking in nanosphere dispersed liquid crystal,” SPIE Optics and Photnics Symposium, Liquid Crystals Conference XV, San Diego, CA, August 2011.

Kuan-Lun Hong, Shuo Zhao**, Iam Choon Khoo**, “Broadband ultrafast all-optical processing with nematic liquid crystals,” SPIE Optics and Photonics Symposium, Liquid Crystals Conference XV, San Diego, CA, August 2011.

**Iam Choon Khoo**, Junbin Huang, Yi Ma, “Plasmonics-enhanced optical fi elds and nonlinearities in liquid crystals,” SPIE Optics and Photnics Symposium , Liquid Crystals Conference XV, San Diego, CA, August 2011.

**I. C. Khoo**, Invited Keynote Lecture, “Plasmonic-liquid-crystals for advanced electro- and nonlinear-optics,” International Workshop on Nano- and Bio-Photonics, Lyon, France, October 2011.

**I. C. Khoo,** “Liquid-crystals-plasmonic metamaterials for advanced optical processing,” Advanced School on Liquid crystals Photonics, Erice, Italy, July 2011.

**I. C. Khoo,** “Liquid Crystals-Plasmonic - Route to Next Generation Electro- and Nonlinear- Optics,” 1st International Conference on Advanced Photonic Polymers, Yokohama, Japan, December 2011.

Chao Feng, **Constantino M. Lagoa,** Mario Sznaier, "Identifying Stable Fixed Order Systems from Time and Frequency Response Data," 2011 American Control Conference, San Francisco, CA, June-July 2011.

B. Yilmaz, M. Ayazoglu, M. Sznaier and **C. Lagoa**, “Convex Relaxations for Robust Identification of Wiener Systems and Applications,” Joint 50th IEEE Conference on Decision and Control and European Control Conference, Orlando, FL, December 2011.

S. Kadetotad, P. Vemulapalli, S. Brennan and **C. Lagoa**, "Terrain-Aided Localization Using Feature-Based Particle Filtering," 4th Annual Dynamic Systems and Control Conference, Arlington, VA, October-November, 2011.

**J.-W. Lee** and G. E. Dullerud, “Joint synthesis of switching and feedback for linear systems in discrete time,” The 14th ACM International Conference on Hybrid Systems: Computation and Control, Chicago, IL, April 2011.

S. Ghosh and **J.-W. Lee,** “Optimal synthesis for finite-time consensus under fixed graphs,” 50th IEEE Conference on Decision and Control, and the European Control Conference, Orlando, FL, December 2011.

S. Mirzazad-Barijough and **J.-W. Lee,** “Finite-state simulations and bisimulations for discrete-time piecewise affine systems,” 50th IEEE Conference on Decision and Control, and the European Control Conference, Orlando, FL, December 2011.

K. Shi, P. S. Edwards, H. Li, Q. Xu, D. Psaltis, **Z. Liu**, "Coherent anti-Stokes Raman scattering holography," Photonics West, San Francisco, CA, January 2011.

M. D. Zhou, C. Yang, **Z. Liu,** J. P. Cysyk and S. Y. Zheng, "A Fabry-Perot pressure sensor fabricated on left ventricular assist device for heart failure implant," 16th International Conference on Solid-State Sensors, Actuators and Microsystems, Beijing, China, June 2011.

J. Ouyang, C. Yang, D. Niu, Y. Xie and **Z. Liu**, "F2BFLY: An On-Chip Free-Space Optical Network with Wavelength-Switching," 25th International Conference on Supercomputing, Tucson, AZ, May -June 2011.

H. Li, Z. Zhang, Q. Xu, K. Shi, Y. Jia, B. Zhang, Y. Xu, and **Z. Liu,** "Second Harmonic Nanoprobes for Femtosecond Laser Pulse Characterization in Complex Microstructures," Conference on Lasers and Electro-Optics, Baltimore, MD, May 2011.

P. Edwards, K. Shi, J. Hu, Q. Xu, Y. Wang, D. Psaltis, and **Z. Liu,** “Coherent anti-Stokes Raman scattering (CARS) holographic biological imaging,” Conference on Lasers and Electro-Optics, Baltimore, MD, May 2011.

Q. Xu, K. Shi, H. Li, K. Choi, R. Horisaki, D. Brady, D. Psaltis, **Z. Liu,** "In-line holographic CARS microscopy," Conference on Lasers and Electro-Optics, Baltimore, MD, May 2011.

C. Yang, K. Shi, H. Li, Q. Xu, V. Gopalan, and **Z. Liu**, "Non-axial-scanning Second Harmonic Microscopy," Conference on Lasers and Electro-Optics, Baltimore, MD, May 2011.

C. Yang, P. Edwards, K. Shi, and **Z. Liu,** "Hybrid Diffractive Optical Element Based Spectrometer," Conference on Lasers and Electro-Optics, Baltimore, MD, May 2011.

S. J. Briczinski, and **J. D. Mathews**, “Statistical implications of UHF diurnal meteor observations,” USNC-URSI National Radio Science Meeting, Boulder, CO, January 2011.

**J. D. Mathews** and F. T. Djuth, “Radar meteor evidence that meteoroid flares generate intense plasma waves,” USNC-URSI National Radio Science Meeting, Boulder, CO, January 2011.

**J. D. Mathews**, “On the role of Bragg scattering in radar meteor head-echoes,” USNC-URSI National Radio Science Meeting, Boulder CO, January 2011.

**J. D. Mathews,** “How do we make sense of non-smooth radar ‘light curves’?” CEDAR Workshop, Santa Fe NM, June - July 2011.

J. H. Klenzing, I. Seker, R. F. Pfaff, D. E. Rowland, S. F. Fung, and **J. D. Mathews**, “Multi-Instrument Observations of an MSTID over Arecibo Observatory,” XXX URSI General Assembly and Scientific Symposium of the International Union of Radio Science, Istanbul, Turkey, August 2011.

I. Seker, W. E. Swartz, **J. D. Mathews**, and N. Aponte, “A new 3D display format relating azimuth-scanning radar data and all-sky images,” XXX URSI General Assembly and Scientific Symposium of the International Union of Radio Science, Istanbul, Turkey, August 2011.

**J. D. Mathews**, “Underdense, overdense, and Bragg scattering in radar meteors,” XXX URSI General Assembly and Scientific Symposium of the International Union of Radio Science, Istanbul, Turkey, August 2011.

S. Sarkhel, S. Raizada, **J. D. Mathews**, C. A. Tepley, and S. A. Gonzalez, “Identification of large scale billows-like structure in the neutral Na layer over Arecibo,” American Geophysical Union Fall Meeting, San Francisco, CA, December 2011.

**T. S. Mayer**, J. Kim, B. Won, M. Li, T. Morrow, W. Hu, S. Dean, H. Liu, A. Vallett, C. D. Keating, and **J. S. Mayer**, “Adding New Capabilities to Si CMOS Via Deterministic Nanowire Assembly," American Vacuum Society Annual Meeting, Nashville, TN, November 2011.

**T. S. Mayer,** J. Kim, B. Won, M. Li, T. Morrow, W. Hu, S. Dean, H. Liu, A. Vallett, C. D. Keating, and **J. S.** **Mayer**, "Adding New Capabilities to Si CMOS Via Deterministic Nanowire Assembly," Electrochemical Society Meeting, Boston, MA, October 2011.

Y. A. Yuwen, W. Hu, S. Yun, **T. S. Mayer**, M. Krishnamurthy, K. G. Eyink, “Self-Organized Freestanding One-Dimensional Gold Nanoparticle Arrays,” Material Research Society Fall Meeting, Boston, MA, November 2011.

**T. S. Mayer**, J. Kim, B. Won, M. Li, T. Morrow, W. Hu, S. Dean, H. Liu, A. Vallett, C. D. Keating, and **J. S. Mayer,** “Adding New Capabilities to Si CMOS Via Deterministic Nanowire Assembly,” American Vacuum Society Annual Meeting, Nashville, TN, November 2011.

K. L. Liddell, X. Zhong, K. Sun, S. L. Dean, **T. S. Mayer**, and C. D. Keating, “Fabrication and Characterization of Phosphonic Acid Monolayers for Use in Biosensing,” 241st National Meeting and Exposition of the American-Chemical-Society, Anaheim, CA, March 2011.

**T. S. Mayer**, J. Kim, B. Won, M. Li, T. Morrow, W. Hu, S. Dean, H. Liu, A. Vallett, C. D. Keating, and **J. S. Mayer**, “Adding New Capabilities to Si CMOS Via Deterministic Nanowire Assembly,” Electrochemical Society Meeting, Boston, MA, October 2011.

D. K. Mohata, R. Bijesh , S. Mujumdar, C. Eaton, R. Engel-Herbert, **T. Mayer**, V. Narayanan, J. Fastenau, D. Loubychev, A. Liu and **S. Datta**, "Demonstration of MOSFET-Like On-Current Performance in Arsenide/Antimonide Tunnel FETs with Staggered Hetero-junctions for 300mV Logic Applications", IEEE International Electron Devices Meeting, Washington DC, December 2011.

D. K. Mohata, R. Bijesh, V. Saripalli, **T. S. Mayer, S. Datta**, “Self-Aligned Gate Nanopillar In0.53Ga0.47As Vertical Tunnel Transistors,” 69th Device Research Conference, Santa Barbara, CA, June 2011.

F. Namin, S. Yun, **T. S. Mayer, D. H. Werner**, C. Rivero-Baleine, “Near-Perfect Optical Mirrors Based on Thin All-Dielectric Zero Index Metamaterial Coatings,” IEEE AP-S International Symposium and USNC/URSI National Radio Science Meeting, Spokane, WA, July 2011.

**R. Mittra**, K. Yoo, J. Bringuier, K. Panayappan, A. Rashidi, H. Mosallaei, N. Mehta, "A numerically efficient approach to metamaterial (MTM) modeling," International Workshop on Antenna Technology, Hong Kong, March 2011.

Y. Zhang, **R. Mittra**, W. Hong, "A zoned two-layer flat lens design," International Workshop on Antenna Technology, Hong Kong, March 2011.

W. Tang, Y. Hao, **R. Mittra**, "Cloaking a reflector antenna using coordinate transformation approach," 5th European Conference on Antennas and Propagation, Rome, Italy, April 2011.

**R. Mittra,** Y. Zhang, "A low-reflection flat-lens design for microwave imaging system," 5th European Conference on Antennas and Propagation, Rome, Italy, April 2011.

**R. Mittra**, U. Pujare, "Real time estimation of motion and range of RFID tags," 5th European Conference on Antennas and Propagation, Rome, Italy, April 2011.

**R. Mittra**, "Making a transition from university research lab to the world of commercial software for EM modeling," 5th European Conference on Antennas and Propagation, Rome. Italy, April 2011.

**R. Mittra**, J. Bringuier, C. Pelletti, K. Panayappan, O. Ozgun, A. Monorchio, "On the hybridization of dipole moment (DM) and finite methods for efficient solution of multiscale problems," 5th European Conference on Antennas and Propagation, Rome, Italy, April 2011.

A.Rashidi, **R. Mittra,** H. Mosallaei, "Scattering performance of plasmonic nanorod antennas: An accurate and fast computational scheme," Conference on Lasers and Electro-Optics (CLEO), Baltimore, MD, May 2011.

W. Yu, X. Yang, Y. Liu, **R. Mittra**, J. Wang, W. Yin, "Advanced features to enhance the FDTD method in GEMS simulation software package," IEEE International Symposium on Antennas and Propagation Spokane, WA, July 2011.

J. N. Bringuier, **R. Mittra**, R, "Efficient analysis of frequency selective surfaces using the Ewald transform," IEEE International Symposium on Antennas and Propagation Spokane, WA, July 2011.

A.K. Rashid, S. Zhongxinag, **R. Mittra**, "On the optimum design of a single-layer thin wideband radar absorber," IEEE International Symposium on Antennas and Propagation Spokane, WA, July 2011.

J.-S. Kim, J. Bringuier, **R. Mittra**, "Spectral evaluation of stirring effect in a reverberation chamber," IEEE International Symposium on Antennas and Propagation, Spokane, WA, July 2011.

A.Rashidi, H. Mosallaei, **R. Mittra**, "Macro basis functions for accurate and fast solution of scattering from elements comprising of junctions of wires and strips," IEEE International Symposium on Antennas and Propagation Spokane, WA, July 2011.

C.Pelletti, **R. Mittra,** K. Panayappan, A. Monorchio, "A universal and numerically efficient method of moments formulation covering a wide frequency band," IEEE International Symposium on Antennas and Propagation, Spokane, WA, July 2011.

G. Bianconi, C. Pelletti, **R. Mittra**, K. Du, A. Monorchio, "A novel technique for an efficient analysis of microwave circuits etched in layered media," IEEE International Symposium on Antennas and Propagation, Spokane, WA, July 2011.

Y. X. Gong, **R. Mittra**, L. Zhen, W.H. Yu, J.T. Jiang, W.Z. Shao, "Edge treatment for sidelobe reduction of parabolic reflector antenna with a two-layer absorber," IEEE International Symposium on Antennas and Propagation, Spokane, WA, July 2011.

W. Yu, X. Yang, Y. Liu, **R. Mittra**, "A novel hardware acceleration technique for high performance parallel FDTD method," IEEE International Symposium on Antennas and Propagation, Spokane, WA, July 2011.

**R. Mittra**, "Antenna design using Transformation Electromagnetics (TEM)," IEEE International Workshop on Electromagnetics, Applications and Student Innovation, Taipei, Taiwan, August 2011.

S. Kahng, **R. Mittra**, "Equivalent circuit model order reduction by real-coefficient AFS," IEEE International Symposium on Electromagnetic Compatibility, Long Beach, CA, August 2011.

M. Naeem, R. Maaskant, G. W. Kant, P.-S. Kildal, **R. Mittra**, "The method of equivalent dipole moments (MEDM) combined with CBFM for the fast and accurate solution of dielectric scattering problems," International Conference on Electromagnetics in Advanced Applications, Torino, Italy, September 2011.

Solovey, M. Wasson, **R. Mittra**, "Measurement of conductive magneto-dielectric material parameters in high noise environment," 41st European Microwave Conference, Manchester, UK, October 2011.

**R. Mittra**, "A look at nano-antennas, nano-sensors and nano-radios-promises and potentials," Loughborough Antennas and Propagation Conference Loughborough, UK, November 2011.

D.P. Fairchild and **R.M. Narayanan**, "Human Activity Classification using Hilbert-Huang Transform Analysis of Radar Doppler Data," SPIE Conference on Radar Sensor Technology XV, Orlando, FL, April 2011.

R. Vela, G. Woodington, M.R. Deluca, and **Ram M. Narayanan**, "Direct Digitization of Ultra-Wideband (UWB) Noise Signals using Frequency Band Folding," SPIE Conference on Radar Sensor Technology XV, Orlando, FL, April 2011.

S. Smith and **R.M. Narayanan**, "Cross-Correlation Analysis of Noise Radar Signals Propagating through Lossy Dispersive Media," SPIE Conference on Radar Sensor Technology XV, Orlando, FL, April 2011.

R. Vela, D. Erisman, and **R.M. Narayanan,** "A Technique for the Generation of Customizable Ultra-Wideband Pseudo-Noise Waveforms," SPIE Conference on Radar Sensor Technology XV, Orlando, FL, April 2011.

R. Vela, **R.M. Narayanan**, and D. Erisman, "A Technique for the Extraction of Ultra-Wideband (UWB) Signals Concealed in Frequency Band Folded Responses," SPIE Conference on Radar Sensor Technology XV, Orlando, FL, April 2011.

G. Woodington, M. DeLuca, R. Moro, D. Lemus, R. Vela, and **R. Narayanan**, "Target Discrimination Technique Utilizing Noise Waveforms," SPIE Conference on Radar Sensor Technology XV, Orlando, FL, April 2011.

M.S. Huang and **R.M. Narayanan**, "Non-Cooperative Collision Avoidance Concept for Unmanned Aircraft System using Satellite-Based Radar and Radio Communication," 30th Digital Avionics Systems Conference, Seattle, WA, October 2011.

J.J. Zhang, S. Bhat, Q. Ding, A. Papandreou-Suppappola, **R.M. Narayanan**, S. Kay, and M. Rangaswamy, "Design and Performance of an Integrated Waveform-Agile Multi-Modal Track-Before-Detect Sensing System," 45th Annual Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, CA, November 2011.

**R.M. Narayanan**, "Earthquake Survivor Detection using Life Signals from Radar Micro-Doppler," 1st International Conference on Wireless Technologies for Humanitarian Relief, Amritapuri, India, December 2011.

**R.M. Narayanan**, "Advances in Noise and Chaotic Radar," International Radar Symposium India, Bangalore, India, December 2011.

**R.M. Narayanan,** "Human Detection and Characterisation Through Barriers," 1st International Conference on Wireless Technologies for Humanitarian Relief, Amritapuri, India, December 2011.

**R.M. Narayanan**, "Radar Tags for Communications and Information Transfer,” International Radar Symposium India, Bangalore, India, December 2011.

M.C. Shastry and **R.M. Narayanan**, "Performance of Basis Pursuit Denoising Algorithms for Compressive Sensing Applications Involving Partial Toeplitz Random Matrices," February Fourier Talks, College Park, MD, February 2011.

Y. Kwon and **R.M. Narayanan**, "Detection Performance of Distributed Radar Systems using Compressive Sensing," February Fourier Talks, College Park, MD, February 2011.

**R.M. Narayanan** and S.C. Small, "National Small Arms Center Educational Initiative," NDIA International Infantry & Joint Services Small Arms Systems Symposium, Exhibition & Firing Demonstration, Indianapolis, IN, May 2011.

**R.M. Narayanan**, "Wireless Technologies for Enhancing Small Arms Effectiveness," NDIA International Infantry & Joint Services Small Arms Systems Symposium, Exhibition & Firing Demonstration, Indianapolis, IN, May 2011.

**R.M. Narayanan**, "Advances in Noise Radar: Tomographic Imaging and Target-Matched Adaptive Illumination," AFOSR Sensing, Surveillance, and Navigation Workshop, Shalimar, FL, June 2011.

A.Bourdon, S. Celestin, and **V. P. Pasko**, “Modeling of electrical discharges in the atmosphere,” French Society of Astronomy and Astrophysics, Paris, France, June 2011.

J.Qin, S. J. Celestin, **V. P. Pasko**, J. Li, and S. A. Cummer, “Direct comparison of optical emissions produced by the model halo event and high speed video observations,” DARPA PhOCAL Program Review, Washington DC, November 2011.

S.Celestin , and **V. P. Pasko**, “Physical processes in lightning leaders producing high energy electrons,” 14th International Conference on Atmospheric Electricity, Rio de Janeiro, Brazil, August 2011.

S. J. Celestin , W. Xu, and **V. P. Pasko**, “Terrestrial gamma-ray flashes produced by energetic electrons during the stepping of lightning leaders,” Fall Meeting, American Geophysical Union, San Francisco, CA, December 2011.

W. A. Lyons, S. A. Cummer, T. Samaras, T. J. Lang, P. R. Krehbiel, W. L. Beasley, **V. P. Pasko**, and E. W. McCaul, Transient luminous events and storms which produce them, National Radio Science Meeting, Boulder, CO, Abstract HG1-2, January 4-7, 2011.

S. Mallios and **V. P. Pasko**, “Charge transfer to the ionosphere and to the ground during thunderstorms,” CEDAR MLT, Santa Fe, NM, June -July 2011.

S. Mallios and **V. P. Pasko**, “Charge transfer to the ionosphere and to the ground during thunderstorms,” Fall Meeting, American Geophysical Union, San Francisco, CA, December 2011.

**V.P. Pasko** and M. Fullekrug, “Waveforms of nighttime atmospherics as a measure of the lower ionospheric electron density profiles over UK and France on August 31, 2008,” National Radio Science Meeting, Boulder, CO, January 2011.

**V. P. Pasko**, “Finite-difference time-domain modeling of infrasonic waves generated by supersonic auroral arcs,” CEDAR-GEM Joint Workshop, Santa Fe, NM, June -July 2011.

**V. P. Pasko**, “Lightning-related transient luminous events at high altitude in the Earth’s atmosphere,” Symposium on Space Plasmas, Brazilian Physics Meeting, Foz do Iguacu, Brazil, June 2011.

**V. P. Pasko**, “Electrostatic mechanism of lightning associated infrasonic pulses from thunderclouds,” 14th International Conference on Atmospheric Electricity, Rio de Janeiro, Brazil, August 2011.

**V.P. Pasko** and M. Fullekrug, “Waveforms of nighttime atmospherics as a measure of the lower ionospheric electron density profiles over UK and France on August 31, 2008,” 30th URSI General Assembly and Scientific Symposium of International Union of Radio Science, Istanbul, Turkey, August 2011.

**V. P. Pasko**, “Numerical modeling of initiation of lightning leaders from tall structures by sprite producing lightning discharges,” Fall Meeting, American Geophysical Union, San Francisco, CA, December 2011.

J. Qin, S. J. Celestin, and **V. P. Pasko**, “Impact of mesospheric ion conductivity variations on the initiation of long delayed sprites,” CEDAR-GEM Joint Workshop, Santa Fe, NM, June -July 2011.

J. Qin, S. J. Celestin, **V. P. Pasko**, J. Li, and S. A. Cummer, “Impact of successive lightning strokes on the initiation and propagation of sprite streamers,” Fall Meeting, American Geophysical Union, San Francisco, CA, December 2011.

J. A. Riousset, **V. P. Pasko**, and A. Bourdon, “Air-density-dependent model for analysis of air heating associated with streamers, leaders, and transient luminous events,” CEDAR-GEM Joint Workshop, Santa Fe, NM, June -July 2011.

W. Xu , S. J. Celestin, and **V. P. Pasko**, “Monte Carlo simulation of terrestrial gamma-ray flashes”, CEDAR-GEM Joint Workshop, Santa Fe, NM, June -July 2011.

W. Xu, S. J. Celestin, and **V. P. Pasko**, “Estimation of source altitudes of terrestrial gamma-ray flashes produced during the stepping of lightning leaders,” Fall Meeting, American Geophysical Union, San Francisco, CA, December 2011.

C. A. Curwen , S. Celestin, W. Xu, and **V. P. Pasko**, “Potential effects of thundercloud induced radiation bursts on aircraft passengers and crew,” NSF EE REU Penn State, July 28, 2011.

S. S. McDonough, J. Qin, and **V. P. Pasko**, “Accurate modeling of ion conductivity in the Earth’s atmosphere,” NSF EE REU Penn State, July 28, 2011.

A. Kshirsagar, S. Pickering, J. Xu, and **J. Ruzyllo**, "Light Emitting Diodes Formed Using Mist Deposition of Colloidal Solution of CdSe Nanocrystalline Quantum Dots", International Symposium On Nanocrystal Embedded Dielectrics for Electronic and Photonic Devices, ECS Spring Meeting, Montreal, Canada, May 2011.

B. Majkusiak, B., A. Mazurak , A. Kshirsagar and **J. Ruzyllo**, "Charging Effects in the MOS Structures with Silicon Nanocrystals Embedded in SiO2", EUROSOI 2011, Cork, Ireland, January 2011.

**J. Ruzyllo**, "Nanotechnology and Its Many Facets", Nanotechics 2011, Warsaw, Poland, October 2011.

D. A. Schmitt, **J. L. Schiano,** and E. I. Laftchiev, "Estimation of Quadrupole Resonance Lineshapes using Narrowband Probes," The 52nd Experimental Nuclear Magnetic Resonance Conference, Pacific Grove, CA, April 2011.

E. I. Laftchiev, **J. L. Schiano**, and C. M. Lagoa, "AM RFI Mitigation in QR based Explosives Detection," The 52nd Experimental Nuclear Magnetic Resonance Conference, Pacific Grove, CA, April 2011.

C. M. Lagoa, A. G. Ashoor, **J. L. Schiano,** "Robust Matched Filter for Detecting QR Signals in the Presence of AM Noise," The 52nd Experimental Nuclear Magnetic Resonance Conference, Pacific Grove, CA, April 2011.

Ping Kao, David Allara, **Srinivas Tadigadapa**, “Label Free Piezoelectric Dna Sensor Arrays Using Novel Selective Immobilization Techniques,” IEEE MEMS Conference, Cancun, Mexico, January 2011.

Hwall Min, Nichole Sullivan, David Allara, Srinivas Tadigadapa, Nanoporous Gold: A High Sensitivity and Specificity Biosensing Substrate, Proc. Eurosensors XXV, Athens, Greece, September 2011.

Hwall Min, David Allara, **Srinivas Tadigadapa**, “Nanoporous Gold: Investigation of the Viscoelastic Properties of Liquids Trapped in Nanoporous Cavities using Micromachined Acoustic Transducers,” Eurosensors XXV, Athens, Greece, September 2011.

P. Saksena, **S. Tadigadapa,** and R. A. Yetter, “Study of Hypergolic Propellants using Micro-Reactors,” 15th International conference on Miniaturized Systems for Chemistry and Life Science, Seattle WA, October 2011.

F. Li, Z. Fang, R. Misra, **S. Tadigadapa, Q. Zhang and S. Datta**, “Giant magnetoelectric effect in nanofabricated Pb(Zr0.52Ti0.48)O3-Fe85B5Si10 Cantilevers and resonant gate transistors,” Device Research Conference, Santa Barbara, CA, June 2011.

Venkata Sharat Parimin, **S.Tadigadapa**, and R. A Yetter, “Multiscale Structures for Reaction Rate Control of Nanoporous Silicon Composites,” National Capital Region Energetics Symposium, La Plata, MD, November 2011.

**J. Urbina**, L. Dyrud, Freddy Galindo, and Ryan Seal, “Observations, Validation and Calibration of the Penn State Meteor Radar,” URSI National Radio Science Meeting, Boulder, CO, January 2011.

F. R. Galindo, **J. Urbina**, J. L. Chau, and L. P. Dyrud, “On the Possible Effect of Signal Processing on Meteor-Head Data from Jicamarca,” URSI National Radio Science Meeting, Boulder, Co, January 2011.

L. P. Dyrud, **J. Urbina**, and F. Galindo,”Plasma Turbulence effects on specular trail observations,” URSI National Radio Science Meeting, Boulder, Co, January 2011.

**D. H. Werner**, Z. H. Jiang, J. P. Turpin and P. L. Werner, "Transformation Optics Collimating Lenses for Multi-Beam Antenna Applications," 4th IEEE International Symposium on Microwave Antenna Propagation and EMC Technologies for Wireless Communications, Beijing, China, November 2011.

**D. H. Werner**, M. D. Gregory, and P. L. Werner, "Nature-Inspired Ultra-Wideband Array Synthesis Techniques," International Conference on Electromagnetics in Advanced Applications and IEEE-APS Topical Conference on Antennas and Propagation in Wireless Communications, Torino, Italy, September 2011.

**D. H. Werner, T. S. Mayer**, J. Turpin, A. Pogrebnyakov, J. A. Bossard, H. J. Shin, C. Rivero-Baleine, N. Podraza, K. Richardson, J. D. Musgraves, R. R. Muise, S. Rogers, and J. D. Johnson, "Adaptive Phase Change Metamaterials for Infrared Aperture Control," SPIE, San Diego, CA, August 2011.

Z. Bayraktar, M. Komurcu, Z. Jiang, **D. H. Werner**, and P. L. Werner, "Stub-Loaded Inverted-F Antenna Synthesis via Wind Driven Optimization," IEEE International Symposium on Antennas and Propagation and USNC/URSI National Radio Science Meeting, Spokane, WA, July 2011.

J. Turpin, Q. Wu, **D. H. Werner**, E. Lier, B. Martin, and M. Bray, "Anisotropic Metamaterial Realization of a Flat Gain-enhancing Lens for Antenna Applications," IEEE International Symposium on Antennas and Propagation and USNC/URSI National Radio Science Meeting, Spokane, WA, USA, July 3-8, 2011.

Y. Zeng, and **D. H. Werner**, “A Geometry-Mode Study on Two-dimensional Conformal Transformations in Electrostatics," IEEE International Symposium on Antennas and Propagation and USNC/URSI National Radio Science Meeting, Spokane, WA, July 2011.

D. Bianchi, S. Genovesi, A. Corucci, A. Monorchio, **D. H. Werner**, and P. L. Werner, "The Pareto Optimization of Wide-Band Conformal Antenna Arrays," IEEE International Symposium on Antennas and Propagation and USNC/URSI National Radio Science Meeting, Spokane, WA, July 2011.

M. Gregory, and **D. H. Werner**, "Next Generation Electromagnetic Optimization with the Covariance Matrix Adaptation Evolutionary Strategy," IEEE International Symposium on Antennas and Propagation and USNC/URSI National Radio Science Meeting, Spokane, WA, July 2011.

F. Namin, **D. H. Werner**, and P. L. Werner, "Broadband Transmission Gratings with Wide Field of View Based on Efficient Optimization of Polynomial Sidewall Profiles," IEEE International Symposium on Antennas and Propagation and USNC/URSI National Radio Science Meeting, Spokane, WA, July 2011.

X. Wang, and **D. H. Werner**, "Application of AIM and MBPE Techniques to Accelerate Modeling of 3-D Periodic Structures with Non-Orthogonal Lattices Composed of Inhomogeneous Bianisotropic Media," IEEE International Symposium on Antennas and Propagation and USNC/URSI National Radio Science Meeting, Spokane, WA, July 2011.

D. Brocker, P. Sieber, P. L. Werner, and **D. H. Werner**, "A Hybrid Approach for Large-Scale Optimizations of Medium Frequency Propagation in Coal Mines," IEEE International Symposium on Antennas and Propagation and USNC/URSI National Radio Science Meeting, Spokane, WA, July 2011.

Z. Jiang, S. Yun, F. Toor, **D. H. Werner**, and **T. S. Mayer**, "Experimental Demonstration of a Conformal Optical Metamaterial Absorber," IEEE International Symposium on Antennas and Propagation and USNC/URSI National Radio Science Meeting, Spokane, WA, July 2011.

M. Gregory, X. Wang, and **D. H. Werner**, "Flexible Design of Doubly Periodic Frequency Selective Surfaces with a Prismatic Mesh Based FEBI Simulation Tool and CMA-ES," IEEE International Symposium on Antennas and Propagation and USNC/URSI National Radio Science Meeting, Spokane, WA, July 2011.

J. Bossard, and **D. H. Werner**, "Multispectral Fractal Random Cantor Superlattices for the Near-Infrared," Proceedings of the 2011 IEEE International Symposium on Antennas and Propagation and USNC/URSI National Radio Science Meeting, Spokane, WA, July 2011.

Z. Jiang, and **D. H. Werner**, "Anisotropic Metamaterial Lens with a Monopole Feed for High-Gain Multi-Beam Radiation," IEEE International Symposium on Antennas and Propagation and USNC/URSI National Radio Science Meeting, Spokane, WA, July 2011.

C. Scarborough, Q. Wu, **D. H. Werner**, E. Lier, B. Martin, and R. Shaw, "A Square Dual Polarization Metahorn Design," IEEE International Symposium on Antennas and Propagation and USNC/URSI National Radio Science Meeting, Spokane, WA, July 2011.

Z. Jiang, S. Yun, Q. Xu, **D. H. Werner, Z. Liu**, and **T. S. Mayer**, "Experimental Verification of a Zero-Index Near-Infrared Metamaterial 2011 IEEE International Symposium on Antennas and Propagation and USNC/URSI National Radio Science Meeting, Spokane, WA, July 2011.

Y. Zeng, X. Wang, **D. H. Werner**, Q. Hao, and T. Huang, "Linear Optical and Surface-enhanced Raman Scattering Study on Metallic Membranes with Subwavelength Complementary Patterns," IEEE International Symposium on Antennas and Propagation and USNC/URSI National Radio Science Meeting, Spokane, WA, July 2011.

Z. Jiang, C. Scarborough, **D. H. Werner**, P. L. Werner, C. Rivero-Baleine, and C. Drake, "An Isotropic 8.5 MHz Magnetic Meta-Lens," IEEE International Symposium on Antennas and Propagation and USNC/URSI National Radio Science Meeting, Spokane, WA, July 2011.

Y. Zeng, Q. Wu, and **D. H. Werner**, "A Lossless Metamaterial with Tunable Permittivity and its Application as a Compact Phase Shifter," IEEE International Symposium on Antennas and Propagation and USNC/URSI National Radio Science Meeting, Spokane, WA, July 2011.

E. Lier, B. Martin, M. Bray, **D. H. Werner**, J. Turpin, and Q. Wu, "Demonstration of Low-Index Meta-Lens for High Gain Low Profile Antennas," IEEE International Symposium on Antennas and Propagation and USNC/URSI National Radio Science Meeting, Spokane, WA, July 2011.

E. Lier, B. Martin, R. Shaw, S. Yang, **D. H. Werner**, Q. Wu, and C. Scarborough, "Demonstration of Soft Meta-Horn with Printed Circuit Board (PCB) Wall Liners," IEEE International Symposium on Antennas and Propagation and USNC/URSI National Radio Science Meeting, Spokane, WA, July 2011.

M. F. Pantoja, A. Rubio Bretones, **D. H. Werner**, P. L. Werner, S. G. Garcia and R. Gomez Martin, "On the Performance of Bundles of CNT-Dipoles in the Terahertz Regime" European Conference on Antennas and Propagation, Rome, Italy, April 2011.

J. P. Turpin, Z. Jiang, P. L. Werner, **D. H. Werner**, and D.-H. Kwon, "Embedded Transformation Optics Lenses for Antenna Performance Enhancement," 27th International Review of Progress in Applied Computational Electromagnetics, Williamsburg, VA, March 2011.

Kaya Tutuncuoglu and **Aylin Yener**, “Transmission Policies for Asymmetric Interference Channels with Energy Harvesting Nodes,” International Workshop on Computational Advances in Multi-Sensor Adaptive Processing, San Juan, Puerto Rico, December 2011.

Basak Guler and **Aylin Yener**, “Interference Alignment for Cooperative MIMO Femtocell Networks,” IEEE Global Telecommunications Conference, Houston, TX, December 2011.

Xiang He, Ashish Khisti and **Aylin Yener**, “MIMO Broadcast Channel with Arbitrarily Varying Eavesdropper Channel: Secrecy Degrees of Freedom,” IEEE Global Telecommunications Conference, , Houston, TX, December 2011.

Xiang He and **Aylin Yener**, “Gaussian Two-way Wiretap Channel with an Arbitrarily Varying Eavesdropper,” IEEE Global Telecommunications Conference Workshop on Physical Layer Security, Houston, TX, December 2011.

Scott T. Rager, Ertugrul N. Ciftcioglu, **Aylin Yener**, Thomas F. La Porta, and Michael J. Neely, “Distributed Backpressure Protocols with Limited State Feedback,” IEEE Military Communications Conference, Baltimore, MD, November 2011.

Ertugrul N. Ciftcioglu and **Aylin Yener**, “Quality-of-Information Aware Transmission Policies with Time-Varying Links,” IEEE Military Communications Conference, Baltimore, MD, November 2011.

Ye Tian and **Aylin Yener,** “Relaying for Multiple Sources in the Absence of Codebook Information,” 2011 Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, CA, November 2011.

Kaya Tutuncuoglu and **Aylin Yener**, “Optimal Power Control for Energy Harvesting Transmitters in an Interference Channel,” Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, CA, November 2011.

Xiang He, Ashish Khisti and **Aylin Yener**, “MIMO Multiple Access Channel with an Arbitrarily Varying Eavesdropper,” 49th Annual Allerton Conference on Communication, Control, and Computing, Monticello, IL, September 2011.

**Aylin Yener** and Igor Stanojev, “Recruiting Multi-Antenna Transmitters as Cooperative Jammers: An Auction-Theoretic Approach,” 49th Annual Allerton Conference on Communication, Control, and Computing, Monticello, IL, September 2011.

Xiang He and **Aylin Yener**, “Secrecy When the Eavesdropper Controls its Channel States,” IEEE International Symposium on Information Theory, Saint Petersburg, Russia, July 2011.

Min Li, Osvaldo Simeone, and **Aylin Yener**, “Leveraging Strictly Causal State Information at the Encoders for Multiple Access Channels,” IEEE International Symposium on Information Theory, Saint Petersburg, Russia, July 2011.

Ertugrul N. Ciftcioglu, **Aylin Yener**, Ramesh Govindan, and Konstantinos Psounis, “Operational Information Content Sum Capacity: Formulation and Examples,” ISIF International Conference on Information Fusion, Chicago, IL, July 2011.

Forrest Iandola, Latemeh Saremi, Tarek Abdelzaher, Praveen Jayachandran and **Aylin Yener**, “Real-Time Capacity of Networked Data Fusion,” ISIF International Conference on Information Fusion, Chicago, IL, July 2011.

Ye Tian and **Aylin Yener**, “Harnessing Interference with an Out-of-Band Relay: an Approximate Capacity Result,” IEEE International Conference on Communications, Kyoto, Japan, June 2011.

Kaya Tutuncuoglu and **Aylin Yener**, “Short-Term Throughput Maximization for Battery Limited Energy Harvesting Nodes,” IEEE International Conference on Communications, Kyoto, Japan, June 2011.

Igor Stanojev and **Aylin Yener**, “Cooperative Jamming via Spectrum Leasing,” 2011 International Symposium of Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks, Princeton, NJ, May 2011.

Rahul Urgaonkar, Ertugrul N. Ciftcioglu, **Aylin Yener**, and Michael J. Neely, “Quality of Information Aware Scheduling in Task Processing Networks,” 7th International Workshop on Resource Allocation and Cooperation in Wireless Networks, in conjunction with IEEE WiOpt 2011, Princeton, NJ, May 2011.

Omur Ozel, Kaya Tutuncuoglu, Jing Yang, Sennur Ulukus, and **Aylin Yener**, “Resource Management for Fading Wireless Channels with Energy Harvesting Nodes,” IEEE International Conference on Computer Communications - Mini Conference, Shanghai, China, April 2011.

Omur Ozel, Kaya Tutuncuoglu, Jing Yang, Sennur Ulukus, and **Aylin Yener**, “Adaptive Transmission Policies for Energy Harvesting Wireless Nodes in Fading Channels,” Conference of Information Sciences and Systems, Baltimore, MD, March 2011.

A. Bar-Noy, G. Cirincione, R. Govindan, S. Krishnamurthy, T. F. LaPorta, P. Mohapatra, M. Neely, and **A. Yener,** “Quality-of-Information Aware Networking for Tactical Military Networks,” Third International Workshop on Information Quality and Quality of Service for Pervasive Computing, Seattle, WA, March 2011.

Min Li, Osvaldo Simeone and **Aylin Yener**, “Message and State Cooperation in a Relay Channel When the Relay Has Strictly Causal State Information,” Information Theory and Applications Workshop, San Diego, CA, February 2011.

G. Xiong, C. Chen, S. Kishore and **A. Yener**, “Smart (In-home) Power Scheduling for Demand Response on the Smart Grid,” IEEE Power and Energy Society (PES) Conference on Innovative Smart Grid Technologies, Anaheim, CA, January 2011.

Shan Wu, Minren Lin, David S-G Lu, Lei Zhu and **Q. M. Zhang**, “Novel Polar-fluoropolymer blends with tailored nanostructure for high energy density and low loss capacitor applications” Material Research Society fall meeting, Boston, MA November-December 2011.

Yang Liu, Ran Zhao, Junhong Lin, Gokhan Hatipoglu, Minren Lin and **Qiming Zhang**, “Enhanced Electromechanical Responses of P(VDF-CTFE)/PMMA Actuators,” Material Research Society fall meeting, Boston, MA November-December 2011.

Yang Liu, Caiyan Lu, Stephen Twigg, Jun-Hong Lin, Gokhan Hatipoglu, Sheng Liu, Nicholas Winograd, **Q. M. Zhang**, “Ion distribution in ionic electroactive polymer actuators by ToF-SIMS,” Smart Structures/NDE Conference, San Diego, CA, March 2011.

**Q. M. Zhang**, Xinyu Li, Haiming Gu, Minren Lin, Xiaoshi Qian, J. P.Cheng, Ailen Cheng, Greg Nellis, and Brent Craven, S. G. Lu, “Giant electrocaloric effect in ferroelectric polymers and their applications for high efficiency cooling devices,” 30th International Conference on Thermoelectrics, Traverse City, MI, July 2011.

**Q. M. Zhang**, “Giant Electrocaloric Effect in Ferroelectrics--A New Frontier in Ferroelectric Research With Great Impact on Energy and Environment,” The Molecular Materials Meeting @ Singapore, International Conference On “Big Ideas In Molecular Materials”, Singapore, January 2011.

 **Q. M. Zhang**, “Electrocaloric Effect (ECE) in Ferroelectric Polymers and Related Cooling Devices-- What We Have Learned?” International Society of Information Fusion, Cambridge, UK, August 2011.

**Q. M. Zhang**, “Multifunctional electroactive polymers and related devices,” International materials research congress, Mexico, August 2011.

**Q. M. Zhang**, “Beyond the traditional polarization responses in electrets: some amazing properties of the ferrorelaxor polymers,” 14th International Symposium on Electrets, Montpelier, France, September 2011.

Gokhan Hatipoglu, Yang Liu, Dean Tigelaar, Mitra Yoonessi, **Qiming Zhang, Srinivas Tadigadapa,** “Fabrication and electromechanical performance of a novel high modulus ionogel micro-actuator,” Eurosensors XXV, Athens, Greece, September 2011.

1. **Patents
*Listed by inventor, title, issue date, and patent number***

**William E. Higgins**, Scott A. Merritt, and Lav Rai, “A Fast 2D-3D Image Registration Method with Application to Continuously Guided Endoscopy,” issued February 15, 2011, #7,889.905

**William E. Higgins**, Scott A. Merritt, and Lav Rai, “A Fast 2D-3D Image Registration Method with Application to Continuously Guided Endoscopy,” issued November 22, 2011, #8,064,669

\*Note: It is the same technology, but two separate patents.

1. **Research Projects Active in 2011**

***Listed by title, sponsoring agency, and faculty member(s)***

“Midwest Institute for Nanoelectronics Discovery Project 1.5 (MIND 1.5)”
University of Notre Dame, Subcontract
**Suman Datta and Theresa Mayer**

“Multi-Gate III-V QWFET”
Semiconductor Research Corporation, Contract
**Suman Datta**

“Correlated Electron Switching Based Tunnel Transistors”
Office of Naval Research, Grant
**Suman Datta**

“Development and Demonstration of Next Generation Electronic Warfare Components based on Graphene Technologies”
Office of Naval Research, Contract
**Suman Datta**

“Ultra-Low Resistance Ohmic Contacts for III-V Digital Logic”
Intel Corp, Contract
**Suman Datta**

“Ultrafast Spectroscopy in Heterojunction Tunnel Transistors”
National Institute of Standards and Technology, Grant
**Suman Datta**

“Architecture-Device Co-Design for Ultra-Low Power Systems”
National Security Agency, Contract
**Suman Datta**

“Heterojunction Tunnel Transistors for Ultra Low Power Logic Applications”
Intel Corp., Sponsored Research Agreement
**Suman Datta**

“Combining Biology with CMOS through Programmed Nanowire Assembly”
Massachusetts Institute of Technology, Subcontract
**Suman Datta and Theresa Mayer**

“Multimodal Image-Guided Intervention System for Lung-Cancer Diagnosis and Staging”
National Cancer Institute, Grant
**William E. Higgins**

“1/f Noise Characterization of VOx films”
Raytheon Company, Sponsored Research Agreement
**Thomas N. Jackson**

“Growth, Characterization and Modeling of Monolithic Silicon Microbolometer Materials for Uncooled Infrared Detectors”
U.S. Army Research, Development and Engineering Command Acquisition Center, Coopertive Agreement
**Thomas N. Jackson**

“High performance Tunable Materials Program Phase II Cost Proposal (Task 09-9C3)”
North Carolina State University, Subcontract
**Thomas N. Jackson**

“Radiation-Hard and Self-Healing Substrate-Agnostic Nanocrystalline ZnO Thin Film Electronics”
Air Force Office of Scientific Research, Grant
**Thomas N. Jackson**

“Flexible and Printed Electronics Program”
Dow Chemical Company, Sponsored Research Agreement
**Thomas N. Jackson**

“Nets:Small:Collaborative Research: Inter-provider dynamics in neutral and non-neutral networks”
National Science Foundation, Grant
**George Kesidis**

“STTR: Saliency Annotation of Image and Video”
Toyon Research Corporation, STTR Sub
**George Kesidis**

“Collaborative: GENI: EAGER: GENI Experiments to Explore Adoption of New Security Services”
National Science Foundation, Grant
**George Kesidis**

“Nonlinear Electro-Optical Liquid Crystalline Materials for High Speed Optical Switching and Signal Processing”
Air Force Office of Scientific Research, Grant
**Iam-Choon Khoo**

“Nanodielectrics for Pulsed Power Applications”
Air Force Research Laboratory, Contract
**Iam-Choon Khoo and Theresa S. Mayer**

“Tunable and reconfigurable negative index materials with low loss”
Purdue University, Subcontract
**Iam-Choon Khoo and Douglas H. Werner**

“Optoelectronic nanohand”
National Science Foundation, Grant
**Zhiwen Liu**

“Long-range Standoff Mobile IED Detection Using Mobile Glass Generated THz Waves”
Office of Naval Research, Grant
**Zhiwen Liu and Shizhuo (Stewart) Yin**

“Nanoprobes for nano-femto optics”
National Science Foundation, Grant
**Zhiwen Liu**

“Welding fume sensing for the construction safety”
Virginia Polytechnic Institute and State University, Subcontract
**Zhiwen Liu**

“EAGER: Adapting the New Arecibo On-Dish HF Transmitter System to Radar Mode”
National Science Foundation, Grant
**John D. Mathews and Julio V. Urbina**

“High-Resolution E/F Region Waves and Electrodynamics Studies Using the Arecibo Observatory Instrument Cluster and the Chain Radars”
National Science Foundation, Grant
**John D. Mathews**

“ARRA: Grid STAR: Smart Grid Training and Application Resource Center”
National Energy Technology Laboratory, Grant
**Jeffrey Mayer**

“Penn State GATE Center of Excellence: In-Vehicle, High-Power Energy Storage Technologies”
National Energy Technology Laboratory, Contract
**Jeffrey S. Mayer**

“DOE/PSU Graduate Student Fellowship Program for Hydropower Research”
U.S. Department of Energy, Grant
**Jeffrey S. Mayer**

“Applied Metamaterials: Metamaterials-Enhanced Technical Applications”
Lockheed Martin Corporation, Inc., Subcontract
**Theresa S. Mayer and Douglas H. Werner**

“Self-Organized One Dimensional Gold Nanoparticle Arrays”
UES, Inc., Purchas Order
**Theresa S. Mayer**

“SOLAR Collaborative: Multiplasmonic light harvesting for thin film solar cells”
National Science Foundation, Grant
**Theresa S. Mayer**

“Nanoscale Contacts”
U.S. Army Research, Development and Engineering Command Acquisition Center, Grant
**Theresa S. Mayer**

“NNIN: National Nanotechnology Infrastructure Network”
Cornell University, Subcontract
**Theresa S. Mayer**

 “Modeling and Fabrication of Nano-enabled Phased Array Antenna”
Lockheed Martin Corporation, Inc., Sponsored Research Agreement
**Theresa S. Mayer and Douglas H. Werner**

“Multilayer Coating on Substrate”
Lockheed Martin Corporation, Inc., Sponsored Research Agreement
**Theresa S. Mayer**

“RET Site: National Nanotechnology Infrastructure Network (NNIN) RET”
Georgia Institute of Technology, Subcontract
**Theresa S. Mayer**

“Combining Biology with CMOS through Programmed Nanowire Assembly”
Massachusetts Institute of Technology, Subcontract
**Theresa S. Mayer**

“Pattern Shaping of Reflector and Lens Antennas for Satellite Applications Using Metamaterials”
Office of Naval Research, Grant
**Raj Mittra**

“Directionally-Tailored Infrared Emission and Transmission”
Office of Naval Research, Grant
**Raj Mittra**

“Metamaterial Antennas for Communication and High Power Applications”
Office of Naval Research. Grant
**Raj Mittra**

“Intelligent Video Search and Retrieval for Transportation Applications”
Xerox Corp., Sponsored Research Agreement
**Vishal Monga**

“SERC: Understanding and Exploiting Feature Dependencies in Robust Image Classification”
Ball State University, Subcontract
**Vishal Monga**

“Integrated Multi-Modal Targeting Sensor Concept for Next Generation Small Arms”
U.S. Army Research, Development and Engineering Command, Contract
**Ram M. Narayanan**

“Instrumentation For Flexible Adaptive Multimodal Radar”
Air Force Office of Scientific Research, Grant
**Ram M. Narayanan**

“Ultrawideband Radar System Development for Landmine and IED Detection”
Delaware State University, Subcontract
**Ram M. Narayanan**

 “Noise Radar Implementation of Compressive Sensing”
Air Force Office of Scientific Research, Grant
**Ram M. Narayanan**

“Radar Test-Bed Development in Support of Multi-Modal Sensing Approaches”
Dynetics, Inc., Purchase Order
**Ram M. Narayanan**

“Energetic Radiation From Lightning Leaders: Effects and Origins”
National Science Foundation, Grant
**Victor P. Pasko**

“CEDAR: Modeling Studies of Infrasonic Waves from Thunderstorms and Aurora”
National Science Foundation, Grant
**Victor P. Pasko**

“FESD Type-1: Electrical Connections and Consequences within the Earth System”
University of Colorado, Subaward
**Victor P. Pasko**

“Physical Origins of Coupling to the Upper Atmosphere from Lightning (PhOCAL)”
Duke University, Subcontract
**Victor P. Pasko**

“Development of Efficient Three-Dimensional Models of Lightning Discharges”
National Science Foundation, Grant
**Victor P. Pasko**

“Simulations and Theory of Streamer Discharges in Transient Luminous Events”
National Science Foundation, Grant
**Victor P. Pasko**

 “CAREER: A Cognitive VHF Radar System Approach to Study Ionospheric Irregularities”
National Science Foundation, Grant
**Julio V. Urbina**

“Eager: Satellite TV Signal Measurement of Precipitable Water Content”
Johns Hopkins University, Subcontract
**Julio V. Urbina**

“Equatorial Vortex Experiment (EVEX): A Study of the Ionospheric Plasma Circulation and Sunset Layer from Kwajalein”
University of Illinois at Urbana-Champaign, Subcontract
**Julio V. Urbina**

“Collaborative Research: A New 50 MHz Radar for Meteor and Aeronomical Science”
National Science Foundation, Grant
**Julio V. Urbina**

“Structural Acoustic and Metamaterial Modeling and Measurements”
Office of Naval Research, Contract
**Douglas H. Werner**

“Full-wave Modeling of Medium Frequency Propagation in Coal Mines”
Office of Naval Research, Contract
**Douglas H. Werner**

“Engineering Materials with Customized Electromagnetic Properties”
Lockheed Martin Corporation, Inc., Sponsored Research Agreement
**Douglas H. Werner**

“Meta-Designs for DMI and Beam Steering”
Lockheed Martin Corporation, Inc., Sponsored Research Agreement
**Douglas H. Werner**

“8.5MHz Magnetic Meta-Lens”
Lockheed Martin Corporation, Inc., Sponsored Research Agreement
**Douglas H. Werner**

“Full-wave Modeling of Medium Frequency Propagation in Coal Mines”
NIOSH-Pittsburgh Research Center, Contract
**Douglas H. Werner**

“Metamaterial RF Current Filter”
Medtronic, Inc., Sponsored Research Agreement
**Douglas H. Werner**

“The Network Science (NS) Collaborative Technology Alliance (CTA)”
BBN Technologies, Cooperative Agreement
**Aylin Yener**

“Rethinking Mobile Ad Hoc Networks: A Non-Equilibrium Information Theory”
University of Texas at Austin, Subcontract
**Aylin Yener**

“NeTS: Medium: Collaborative Research: Rechargeable Networks”
National Science Foundation, Grant
**Aylin Yener**

“CIF: Medium: Collaborative Research: Interactive Security”
National Science Foundation, Grant
**Aylin Yener**

“Development of battery safety guidelines for underground coal mine communications and personnel tracking equipment”
National Institute for Occupational Safety & Health, Contract
**Aylin Yener**

“Unconventional High Density Vertically Aligned Conducting Polymer/Carbon Nanotube Composites for Ultrahigh Energy Density and Power Density Energy Storage Devices”
Air Force Office of Scientific Research, Grant
**Qiming Zhang**

“Ferroelectric Polymers with Ultrahigh Energy Density, Low Loss, and Broad Operation Temperature For Navy Pulse Power Capacitors”
Office of Naval Research, Grant
**Qiming Zhang**

“Ionic Liquids in Electroactive Devices (ILEAD) MURI”
Virginia Polytechnic Institute and State University, Subcontract
**Qiming Zhang**

“Ionic Electroactive Polymer Actuators with Tailored NanoStructure Morphology”
National Science Foundation, Grant
**Qiming Zhang**

“Giant Electrocaloric Effect in Ferroelectric Polymers with Tailored Polar-Nanostructures”
U.S. Department of Energy, Grant
**Qiming Zhang**

“Understanding the Scientific Basis of Electrocaloric Effect In Defects Modified Ferroelectric Polymers”
Army Research Office, Grant
**Qiming Zhang**

“SBIR-Multiferroic Heat Pumps (Phase II)”
Strategic Polymer Sciences, SBIR Sub
**Qiming Zhang**

1. **Editorship in Journals**

*Listed by publication, title and faculty member*

ECS Interface, Guest Editor, **Jerzy Ruzyllo**

Electron Technology, Editorial Board, **Jerzy Ruzyllo**

Ferroelectrics, Editorial Board Member, **Kenji Uchino**

IEEE Antennas and Propagation Magazine*,* Editor,**Doug Werner**

IEEE Transactions on Aerospace and Electronic Systems, Associate Editor for Radar, **Ram Narayanan**

IEEE Transactions on Communications, Editorial Board, **Aylin Yener**

IEEE Transactions on Control Systems Technology, Associate Editor, **Constantino Lagoa**

IEEE Transactions on Ferroelectrics, Ultrasonics, and Frequency Control, Associate Editor, **Qiming Zhang**

IEEE Transactions on Geoscience and Remote Sensing, Associate Editor, **Kultegin Aydin**

IEEE Transactions on Image Processing, Associate Editor. **Vishal Monga**

IEEE Transactions on Medical Imaging, Associate Editor, **William Higgins**

IEEE Transactions on Wireless Communications, Editorial Board, **Aylin Yener**

IEEE Control Systems Society Conference Editorial Board, Associate Editor, **Ji-Woong Lee**

International Journal of Wireless Information Networks, Editorial Board, **Mohsen Kavehrad**

International Symposium on Semiconductor Cleaning Science and Technology, Edi**tor, Jerzy Ruzyllo**

Journal of Atmospheric and Solar-Terrestrial Physics, Guest Editor, **Julio Urbina**

Journal of Electroceramics, Editorial Board Member, **Kenji Uchino**

Journal of Emerging Technologies in Computing Systems, Associate Editor, **Suman Datta**

Journal of Engineering, Editorial Board, **Qiming Zhang**

Journal of Geophysical Research, Associate Editor, **Victor Pasko**

Journal of Micro/Nanolithography, MEMS and MOEMS, Associate Editor, **Srinivas Tadigadapa**

Journal of Nonlinear Optical Physics and Materials, Editor-in-Chief, **Iam-Choon Khoo**

Materials Technology, Associate Editor, **Kenji Uchino**

Measurement Science and Technology, Associate Editor, **Srinivas Tadigadapa**

Optical Memory and Neural Networks, Associate Editor, **Shizhuo (Stuart) Yin**

Photonic Fiber and Crystal Devices V - SPIE Symposium on Optics and Photonics, Co-Editor, **Shizhuo (Stuart) Yin**

Radio Science, Associate Editor, **Victor Pasko**

Sensors and Materials, Editorial Board Member, **Kenji Uchino**

## IV. Awards

## Penn State Engineering Alumni Society Awards*Premier Research Award* Kenji Uchino

## Faculty Promotions*Assistant Professor* Tim Wheeler

## *Professor* Suman Datta

## College of Engineering Awards*Outstanding Engineering Alumni Award* Dale Hoffman

## Penn State Electrical Engineering Society Awards

## *Early Career Recognition Alumni Award*

## Brandon Ritrovato, Lockheed Martin

1. **Department Activities**
2. Bose Memorial Library Dedication
The Bose Memorial Library was dedicated on April 22, 2011 in 204 Electrical Engineering West. Nirmal Bose, HRB-Systems Professor of Electrical Engineerinf died on Nov. 22, 2009, at the age of 69, while on sabbatical at the university of Wuppertal in Germany. Bose’s wife, Chandra Bose, donated his extensive library to the Department of Electrical Engineering. The library will be housed in the Christopher Raspanti Memorial Digital Signal Processing Laboratory.
3. **Research Experience for Undergraduates**

The Research Experience for Undergraduates (REU) is a National Science Foundation (NSF) funded program which supports active research participation by undergraduate students who come to Penn State from other universities. 2011 marks the ninth year for the program at Penn State.

The 2011 participates are listed along with their, university, research topic, and faculty mentor.

Christopher Curven
Penn State University
Potential Effects of Thundercloud Induced Radiation Bursts on Aircraft Passengers and Crew
**Victor Pasko**

Sean McDonough
University of Rochester
Accurate Modeling of Ion Conductivity in the Earth’s Atmosphere
**Victor Pasko**

Christopher Hong
Cooper Union College
Study of Doppler Velocity Estimation Techniques on Meteor-Head Radar Reflections
**Julio Urbina**

Dimitri Ressetar
Penn State – Harrisburg
Study of Processing Techniques for Removal of Equatorial Electrojet Echoes to Enhance Meteor Detection at Jicamarca
**Julio Urbina**

Christopher Jones
Washington State University
Considerations for an Intra-Solar System Laser Satellite Data Network
**John Mathews**

Christopher Galvan
New Mexico State University
System Development and Integration Of Communication and Power Link Between Olite 2 Satellite and High Altitude Student Platform
**Sven Bilén**

Luis Olique
University of Puerto Rico at Mayaguez
Development of a Charging Method for the Geopebbles Using Wireless Power Transmission
**Sven Bilén**

Danielle Sova
George Mason University
Robustness and Fault Tolerant Capabilities of Transform Domain Fir Filters Working on Real Signals
**Ken Jenkins and Dave Salvia**

Jacob Wilson
West Virginia Wesleyan College
Verification of a Marginal Oscillator for Continuous-Wave Quadrupole Resonance Spectroscopy
**Jeff Schiano**

Bahareh Ardestani
American River College
Optical and Electrical Characterizations of Free Standing Microelectromechanical Structures
**Srinivas Tadigadapa**

Christina DiMarino
James Madison University
Growth and Optical Analysis of Branching Silicon Wire Arrays
**Joan Redwing**

Ruth Nan
Washington University in St. Louis
Development of a Near-Field Scanning Optical Microscope System
**Zhiwen Liu**

Matthew Feldman
University of Florida
MRI Microcoils for Imaging Individual Cells
**Mike Lanagan**

1. **Industrial and Professional Advisory Council (IPAC)**IPAC is a select group of Penn State alumni from industry, government agencies, and academia who advise the department on academic issues and on current trends and future directions in engineering. The group met in March on the Penn State campus and had discussions with faculty and students. A report was prepared outlining their recommendations for the department.

IPAC members are listed with their companies.

John Croteau, NXP Semiconductors

John Golombeck, Northrop Grumman

Dale Hoffman, retired U.S. Navy civilian

Forrest Hunsberger, MIT Lincoln Laboratory

Leslie Melaragno, Rockwell Automation

Richard Pieper, Henkels & McCoy

Thomas Roell, Parsons Infrastructure & Technology Group

Douglas Schultz, Key North, LLC

Edward Singel, retired

Scott Thompson, Oberon Inc.

Joseph Trench, Lockheed Martin

William Wannisky, Fitzpatrick, Cella, Harper, and Scinto

1. **Arthur H. Waynick Memorial Lecture**

**Neil DeGrasse Tyson, director of the Hayden Planetarium, was the 2011 Waynick speaker on April 6.** Tyson has a bachelor’s degree in physics from [Harvard](http://www.harvard.edu/) University and a Ph.D. in astrophysics from [Columbia](http://www.columbia.edu/)University. Tyson is the recipient of twelve honorary doctorates and the NASA Distinguished Public Service Medal. His contributions were recognized by the International Astronomical Union in their official naming of asteroid 13123, Tyson.

1. **Mentoring Program**

2011 was the first full year of the department mentoring program with a group of 85 mentor/student pairs.

1. **Sabbatical***Spring2011*

 John Doherty

 Zhiwen Liu
 Kenji Uchino

*Fall 2011*

 Jim Breakall
 David Miller
 Doug Werner

 Kenji Uchino

1. **Retirements**Anna Kennedy, graduate admissions administrative assistant
Mona Shaw, department head administrative assistantJanet Woomer, administrative support assistant
2. **New Hires**Kris McNitt, proposal and grant generalist
Dawn Nelson, department head administrative assistant
Donna O’Shea, systems administrator
Lisa Timko, graduate admissions administrative assistant
3. **Penn State Electrical Engineering Society**Officers
 President: Dale Hoffman
 Vice President: Jim Blazer
 Secretary/Treasurer: Eric Kline