Julia W. P. Hsu

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Richardson, TX 75080

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EXPERIENCE:

University of Texas at Dallas

2010 – present Professor, the Erik Jonsson School of Engineering and Computer Science
2010 – present Texas Instruments Distinguished Chair in Nanoelectronics
2011 – present Associate Head, Department of Materials Science and Engineering
2011 – present Graduate Director, Department of Materials Science and Engineering

Sandia National Laboratories

2003 - 2010 Principal Member of Technical Staff, Surface & Interface Science
2006 - 2010 Scientist, Center for Integrated Nanotechnologies

Bell Laboratories, Lucent Technologies Inc.

1999 - 2003 Member of Technical Staff, Semiconductor Physics

University of Virginia

1997 - 2001 Associate Professor of Physics (with tenure)
1993 - 1997 Assistant Professor of Physics

AT&T Bell Laboratories

1990 - 1992 Postdoctoral Member of Technical Staff, Supervisor: M. J. Cardillo

EDUCATION:

1985 - 90 **Stanford University, Stanford, CA 94305**

Ph. D. in physics, 1991
Thesis: Novel Transport Properties of Two-Dimensional Superconductors
Advisor: A. Kapitulnik

M. S. in physics, 1987

1981 - 85 **Princeton University, Princeton, NJ 08544**

B. S. E. *summa cum laude* in chemical engineering, 1985
Thesis: Efficiency of He and N_2 as Third Body Gases in Cs^{133}-Xe^{129} Systems
Advisor: W. Happer

Program certificate in engineering physics, 1985

HONORS & AWARDS:

2011 Materials Research Society (MRS) Fellow. Citation: *For contributions to understanding relationships between materials structure and electronic properties at the nanoscale via careful experimentation and technique development, and for leadership of the materials research community*.

2007 American Association for the Advancement of Science (AAAS) Fellow

2007	Sandia National Laboratories, Laboratory Directed Research & Development, Award for Excellence, "Nanolithography Directed Materials Growth and Self-assembly"
2005	First Prize, "Science as Art" Competition at 2005 Spring Materials Research Society Meeting
2002	Outstanding Speaker Award, ONR workshop on Extended Defects in Wide Gap Semiconductors
2001	American Physical Society (APS) Fellow. Citation: *For pioneering work in applying scanning probe microscopy techniques to elucidate the nanometer scale electronic and optical properties of novel materials, in particular the physics related to defect*
1996	Harrison Award, University of Virginia
1994	Alfred P. Sloan Foundation Research Fellowship
1993	National Science Foundation Young Investigator Award
1986	Apker Award from the American Physical Society
1985 - 90	John and Fannie Hertz Foundation Fellowship
1985 - 90	Graduate Research Program for Women Grant from AT&T Bell Labs
1985	Phi Beta Kappa Tau Beta Pi, and Sigma Xi
1985	Allen G. Shenstone Prize in Physics, James Hayes-Edgar Palmer Prize in Engineering, Jeffrey O. Kephart Award in Engineering Physics, Princeton University
1983	Society of Women Engineers Bechtel Corporation Scholarship

RESEARCH INTERESTS:

- Electronic and transport properties at the organic-inorganic interface
- Growth and assembly of semiconductor nanostructures
- Nanostructured composites for solar energy harvesting
- Nanomaterials for energy applications
- Spatially resolved studies of local electrical and optoelectronic properties

AREAS OF EXPERTISE:

- Emergent photovoltaics, e.g. organic, hybrid, perovskite
- Solution synthesis of inorganic nanostructures, e.g. ZnO, $CuGaO_2$, transition metal dichalcogenides
- Interfacial phenomena between dissimilar materials, e.g. metal/organic, oxide/organic, oxide/metal
- Growth and properties of lattice-mismatched semiconductors, e.g. GeSi/Si, GaAs/Ge, GaN/sapphire
- Scanning probe microscopy and spectroscopy, e.g. AFM, conducting-tip AFM, NSOM
- Semiconductor defect characterization, e.g. conducting-tip AFM, capacitance spectroscopy
- Oxide catalysts for NO oxidation
- Superconductivity, metal-insulator transition, proximity effect

PROFESSIONAL ASSOCIATIONS:

American Physical Society
Materials Research Society

RESEARCH FUNDING:

- "Transistor-based High-gain High-bandwidth Photodetectors," Texas Photonics Center, $34,670, 2017, PI

- "Nano-engineered Polymer Composites for Dielectric and Magnetic Applications," Texas Instruments, $75,000, 2016, PI
- "Creativity Extension: Impact of Interfacial Contact Layers on Photon-to-Electron Conversion Loss in Organic Solar Cells," National Science Foundation, $299,999, 2016, PI
- "Nano-engineered Polymer Composites for Dielectric and Magnetic Applications," Texas Instruments, $50,000, 2015, PI
- "Creativity Extension: Impact of Interfacial Contact Layers on Photon-to-Electron Conversion Loss in Organic Solar Cells," National Science Foundation, $299,999, 2015, PI
- "Nano-engineered Polymer Composites for Dielectric and Magnetic Applications," Texas Instruments, $36,000, 2014, PI
- "Sulfur Poisoning of Complex Oxide Catalysts for Nitric Oxide (NO) Oxidation: Effect of Crystal Structure and Stoichiometry," Welch Foundation, $180,000, 2014, PI
- "Impact of Interfacial Contact Layers on Photon-to-Electron Conversion Loss in Organic Solar Cells," National Science Foundation, $474,278, 2013, PI
- "Synthesize Iron Nanoparticles in a Polymeric Matrix Suitable for Magnetic Core Materials," Sandia National Laboratories, $85,000, 2013, PI
- "Synthesize Iron Nanoparticles in a Polymeric Matrix Suitable for Magnetic Core Materials," Sandia National Laboratories, $85,000, 2012, PI
- "Explore Microwave-assisted Synthesis for Synthesizing Iron and Iron Oxide Nanoparticles," Sandia National Laboratories, $50,000, 2012, PI
- "Carrier Transport Layer for Organic Photovoltaics," Sandia National Laboratories, $22,531, 2011, PI
- "Enhanced Optical Absorption in Polymer Solar Cells with Plasmonic Nanostructures," CONTACT, $57,000, 2010 - 2011, PI
- "Development of Electron Nano-Probe Techniques for Structural Analysis of Nanoparticles and Amorphous Thin Films," Sandia LDRD, 10/2009-9/2010, Team Member
- "Understanding Charge Separation and Transfer at Interfaces in Energy Materials and Devices (CST)," Energy Frontier Research Centers, $15,000,000 total, 10/2009-9/2014, Team Member
- "Hierarchical Morphology Control for Nanocomposite Solar Cells," Sandia LDRD, $1,875,000, 10/2008-9/2010, PI
- Subcontract from NREL OPV Program, DOE EERE, $250,000/yr, 1/2008-9/2010, PI
- "Nanolithography by Combined Self-Assembly and Directed-Assembly," Sandia LDRD, $900,000, 10/2007-9/2010, Team Member
- "Interactions of Organics with Inorganic Nanoparticles and Nanocomposites," DOE Basic Sciences, $300,000/yr, 10/2007-9/2010, PI
- "Nanoengineering of Active Interfaces for Organic-Inorganic Optoelectronics," Sandia LDRD, $1,480,000, 10/2006-9/2009, Team Member
- "Nanocrystals-based Next-generation Photovoltaics," Director of Central Intelligence Postdoctoral Fellowship, $282,000, 2006-2009, PI
- "Piezoelectric Properties of Arrayed Nanostructures of Zinc Oxide for Sensor Applications," Truman Fellowship, $735,000, 10/2005-9/2008, PM
- "Active Assembly for Large-Scale Manufacturing of Integrated Nanoelectronics," Sandia LDRD, $835,000, 10/2005–9/2008, Team Member
- "A Discovery Platform for Nanowire Electronics and Photonics," Sandia LDRD, $954,000, 10/2005–9/2008, Team Member
- "Creating a Discovery Platform for Defined-space Chemistry and Materials: Metal Organic Frameworks," Sandia LDRD, $1,020,000, 10/2005–9/2008, Team Member
- "Development of Nanostructured and Surface Modified Semiconductors for Hybrid Organic-Inorganic Solar Cells," Sandia LDRD, $1,170,000, 10/2005–9/2008, PI
- "Nanolithography Directed Materials Growth and Self-assembly," Sandia LDRD, $1,200,000, 10/2003–9/2006, PI
- "Development of Nanoscale Print-head Technology for Lithographic Patterning of Large Area Substrates," DARPA, $2,700,000; 9/98–8/2002 (one of seven co-P.I.s)

- "Submicron Scale Studies of Optical Anisotropy in Thin Films," National Science Foundation; $239,066 + $28,628 supplement, 9/98–8/2001, PI
- "Nanometer Scale Studies of Defects in Photovoltaic Materials," Department of Energy; $240,000, 1/98-12/2000, PI
- "Pulsed Laser Deposition System for Oxide Films," Jeffress Memorial Trust; $20,000, 7/97-6/98, co-PI
- "Acquisition of Equipment to Assist in the Synthesis and Property Measurement of Bulk Amorphous and Nanocrystalline Metal Alloys," National Science Foundation; $28,600, 9/96-8/97, team member
- "The Science and Technology of Metallic Glasses and Nanocrystalline Materials," Academic Enhancement Program, University of Virginia; $799,876, 6/95-5/98
- "Development of Variable - Temperature Near-field Optical Microscope," National Science Foundation; $150,000, 9/94-8/98, co-PI
- "Sloan Research Fellowship," Alfred P. Sloan Foundation; $30,000, 9/94-8/99, PI
- "Spatially-Resolved Optical and Transport Properties of Compound Semiconductor Thin Films and Devices," Jeffress Memorial Trust; $34,000, 1/94-6/97, PI
- "Spatially-Resolved Optical Properties of Poly(para-Phenylene Vinylene) Using a Near-field Scanning Optical Microscope," Petroleum Research Fund; $20,000, 9/93-8/95, PI
- "Young Investigator Award," National Science Foundation; $312,500, 7/93-8/99, PI

PROFESSIONAL ACTIVITIES:

- Member, Meeting Quality Subcommittee, Materials Research Society (2012-present)
- Advisory panel, Princeton Center for Complex Materials (2009-2020)
- Panel review for NSF EPM (2014)
- Scientific Committee Member, 2012 Inter-Continental Advanced Materials for Photonics (I-CAMP) Summer School on Renewable and Sustainable Energy
- External Review Committee, Center for Integrated Nanotechnologies (CINT) (2011-present)
- Member, Nomination Committee, of the American Physical Society Division of Materials Physics (2011-2013)
- Member, Nomination Committee, of the American Physical Society Division of Condensed Matter Physics (2010)
- Panel review for NSF Solar Initiative (2010)
- Chair, International Relations Committee, Materials Research Society (2010-2011)
- External Advisory Committee, U. Massachusetts Energy Frontier Research Center (2009-2014)
- Chair, Program Committee for American Physical Society Workshop on Energy Research for Young Physicists, American Physical Society Topic Group on Energy Research and Applications (2010)
- Advisory board, International Conferences on Modern Materials and Technology (2009-2010)
- Advisory board, TACT 2009 International Thin Film Conference (2009)
- Review panel, DOE EPSCoR program of Idaho State University (2008-2009)
- James C. McGroddy Prize selection committee, American Physical Society (2007-2008)
- Member, Program Committee for American Physical Society Workshop on Energy Research for Young Physicists (2008-2009)
- Treasurer and Chair of Operational Oversight Committee, Materials Research Society (2006-2007)
- Review panel for DOE Solar Energy Utilization Initiative (2007)
- Board of Directors, Materials Research Society (2005-2007)
- Member-at-Large in the Executive Committee of the American Physical Society Division of Materials Physics (2004-2007)
- Editorial Board, Solid State Communications (2005-2008)
- Lead organizer for 2007 Materials Research Society Fall Meeting Symposium F: "Interfaces in Organic and Molecular Electronics III"
- Meeting Chair for the 2004 Materials Research Society Fall Meeting

- Co-organizer, "Interfacial Phenomena in Nanostructured Materials and Devices" Workshop at Telluride Science Research Center (2008, 2010, 2012)
- Member of the Minerals, Metals and Materials (TMS) Society Electronic Materials Committee (2000-2006)
- Invited organizer for 1997-2011 Electronic Materials Conference
- Invited participants on DOE Workshop on "Basic Research Needs for Solar Energy Utilization" (2005)
- Invited participants in the Special National Nanotechnology Initiative (NNI) Interagency Grand Challenge Workshop on Instrumentation and Metrology at NIST (2004)
- Invited participants in U. S. National Academy of Engineering "Nineth Annual Symposium on Frontiers of Engineering" (2003)
- Invited participants in Vision2020 Nanomaterials and the Chemical Industry R&D Roadmap Workshop (2002)
- Panel review for NSF Materials Research Science and Engineering Centers reverse site visit (2002)
- Invited participants in U. S. National Academy of Sciences "Thirteenth Annual Symposium on Frontiers of Science" (2001)
- Member of American Physical Society Committee on the Status of Women in Physics site visiting committee to Penn State (2000)
- Lead organizer for 1998 Materials Research Society Spring Meeting Symposium S: "Nanoscale Materials Characterization Using Scanning Probes"
- Panel review for NSF Career Award (1998)
- Panel review for NSF Major Research Instrumentation (1997)
- Invited participants in U. S. National Academy of Sciences "Sixth Annual Symposium on Frontiers of Science" (1994)
- Review papers for Phys. Rev. Lett., Appl. Phys. Lett., Nano Lett. J. Appl. Phys., Phys. Rev. B, Rev. Sci. Instrum., Science, J. Phys. Chem., J. Crys. Growth, Langmuir, Advanced Materials, Small, Chem. Phys. Lett., Solid State Comm., Thin Solid Films, Org. Electron. Appl. Surf. Sci., Elec. Device Lett., J. Elec. Mater., J. Am. Chem. Soc., ACS Nano, J. Mater. Chem. A&C, ACS Appl. Mater. & Interface, Adv. Energy Mater., Adv. Func. Mater., Adv. Mater., Nanoscale, RSC Advances, Phys. Chem. Chem. Phys., J. Phys. Chem. C, J. Phys. Chem. Lett., Optics Express, Optics Letters, Europhysics Lett., Scanning Microscopy, J. Materials Science, Mater. Sci. Eng. B, Materials Research Society Meeting Proceedings
- Review proposals for NSF, DOE, EPA, and ARO

TEACHING:

CURRENT STUDENTS AND POSTDOCS:

PhD:

- Diego Barrera: MSEN, January 2012 – present
- Liang Xu: MSEN, September 2012 – present
- Sampreetha Thampy: MSEN, September 2014 – present
- Michael Womble: MSEN, September 2015 – present
- Trey Daunis: MSEN, Januray 2016 – present

STUDENTS AND POSTDOCS SUPERVISED:

Research Scientist:

- Yun-Ju Lee: MSEN, September 2010 – August 2015

Postdoc:

- Liang Xu: July 2017 – October 2017
- Diego Barrera: June 2017 – August 2017, CIMAV - Monterrey

- Jian Wang: January 2015 – May 2017, University of Washington, Washington Research Foundation Innovation Fellowships in Clean Energy
- Yun-Ju Lee: January 2006 – August 2010, Research Scientist at Air Force Research Laboratory (UES)
- Robert J. Davis: December 2008 – September 2010, Staff Scientist at GE Research
- Summer R. Ferreira: June 2009 – August 2010, Senior Member of Technical Staff at Sandia National Laboratories
- Matthew T. Lloyd: July 2007 – July 2009;
- Aaron Trionfi: Nov 2006 – Dec 2008; Research Analyst at CNA (formerly Center for Naval Analyses)
- Dana C. Olson: Feb 2006 – Feb 2008; Sr. Scientist at NREL
- David A. Scrymgeour (Truman Fellow): May 2005 – September 2008; Sr. Member of Technical Staff at Sandia National Laboratories
- Tae-woo Lee: March 2002 – August 2003; Assistant Professor of Materials Science and Engineering, Pohang University of Science and Technology, South Korea
- Rick Bley: 1997 - 1999

PhD:

- Boya Zhang (Fall 2017 – present)
- Lakshmi Narayanan (Summer 2017 – present)
- Michael Womble (Fall 2015 – present)
- Sean Dillon (co-advised with Yves Chabal, Spring 2017 – present)
- Trey Daunis (Summer 2015 – present)
- Sampreetha Thampy (Spring 2015 – present)
- Liang Xu (2017), *Charge Dynamics and Device Physics in Bulk-Heterojunction Organic Photovoltaics*
- Diego Barrera (2017) *Synthesis and Characterization of Transition Metal Oxides and Dichalcogenides and Their Application in Organic Photovoltaics*; CIMAV - Monterrey
- Jian Wang (2015) *Nanomaterials as Interfacial Contact Layers for Organic Photovoltaics*; University of Washington
- Anthony L. Campillo (2001) *Near-field Scanning Optical Microscopy Studies of Photonic Structures and Materials*; Naval Research Laboratory
- Matthew H. Gray (2001) *Near-field Photocurrent Studies of Temperature and Polarization Dependence in Relaxed SiGe Films on a Si Substrates*; National Renewable Energy Laboratory
- Qin Xu (1998) *Surface Morphological and Electronic Studies of GaAs Films Grown on Ge and Ge/Si Substrate*; Principal Engineer, New Scale Technologies, Inc.
- Eric B. McDaniel (1997) *Nanometer Scale Studies of Novel Oxide Materials Using Near-field Scanning Optical Microscopy*

MS Thesis:

- Sampreetha Thampy (2014) *Synthesis and Characterization of Transition Metal-Mullite Catalysts for Nitric Oxide (NO) Oxidation*
- Frederik F. Schrey (2002) *A Microscope for Imaging, Spectroscopy, and Lithography at the Nanometer Scale: Combination of a Two-photon Laser Scanning Optical Microscope and an Atomic Force Microscope*
- Amanda McDaniel (1997) *Near-field Scanning Optical Microscopy Studies of Cu(In,Ga)Se_2 Solar Cells*

MS: Trey Daunis (2015); Kaiyuan Luo (2014); Juan Yi (2012)

MA: Penelope L. Slocum (1994)

BA/BS: Anna C. Mueller (Fall 2016-Spring 2017, Mechanical Engineering); Nicholas Inocencio (Fall 2016, Electrical Engineering); Adeoluwa Babatunde (Fall 2015-Fall 2016, Computer Science); Brandon Adkison (Summer & Fall 2014, Biochemistry);

William Enderlein (Fall 2012, Mechanical Engineering); A. C. Shaikh (Spring 2011, Mechanical Engineering); R. Kelly (1999); Anthony L. Campillo (1995-96); Benjamin J. Cook (1994)

Undergraduate Summer Students:

Laura Quiroga (2017); Daniel Hwu (2017); Aakash Gadh (2017); Aaron Kramer (2015); Claire Friedman (2013); Yasmin Noor (2012); James Gould (2012); Erica Fang (2006-2009); Stuart Kirschner (2009); Nolan Chang (2005-2006); Theresa Clement (2005); Colin Ducharme (1998); Richard Janowski (1996); Anthony L. Campillo (1995); Karen E. Johnson (1995); Wendy Garber (1994)

High School Students:

Daniel Wang (2016); Akash Kumashi (2016); Benjamin Liu (2015); Rachna Parikh (2015); Jared Nysetvold (2014); Stephen Nelson (2014); Jason Chang (2013); Vanessa Ibarra (2013, 2014); Samuel Cheng (2012); Galen Gao (2011-2012); Tyler Hostetter (2011); Nolan Chang (2004)

COURSES TAUGHT AT THE UNIVERSITY OF TEXAS AT DALLAS:

Thermodynamics, MSEN 5310 – core course for MSEN graduate students (F15, F17)

Materials Characterization, MSEN5360 – core course for MSEN graduate students (S13, S14, S15)

Introduction to Materials Science and Engineering, MSEN5300 -- for graduate and upper level undergraduate students without background in MSEN (F10, F11, F12, S16)

Electromagnetism and Waves, PHYS2326 – calculus based physics for engineering students (S12)

Introduction to Engineering and Computer Science, ECS1200 (4 sections) – for freshmen engineering majors (F13)

Dissertation and Thesis Committee:

Jian Wang – Ph. D., MSEN (Chair, graduated 10/2015)
Louis Caillard – Ph. D., MSEN (graduated 11/2014)
Kui Tan – Ph. D., MSEN (graduated 5/2014)
Kamil Mielczarek – Ph. D., Physics (graduated 3/2013)
Yi Yang – Ph. D., EE (graduated 6/2012)
Diego Barrera – Ph. D., MSEN (Chair, graduated 5/2017)
Liang Xu – Ph. D., MSEN (Chair, graduated 5/2017)
Sampreetha Thampy – Ph.D., MSEN (Chair)
Michael Womble – Ph.D., MSEN (Chair)
Sean Dillon – Ph.D., MSEN (co-chair)
Trey Daunis – Ph. D., MSEN (Chair)
Lakshmi Narayanan – Ph.D. MSEN (Chair)
Boya Zhang – Ph.D. MSEN (Chair)
Fantai Kong – Ph.D., MSEN (graduate 5/2017)
Minghua Li – Ph.D., EE (Outside Chair, 3/2016)
India Stewart – Ph. D., Public Affairs (Outside Chair, 7/2013)

COURSES TAUGHT AT THE UNIVERSITY OF VIRGINIA:

Basic Physics Laboratories II -- for pre-meds and science majors (1999 Spring)
General Physics III Laboratories -- for engineers (1999 Spring)
Introductory Physics III -- Electricity and Magnetism for Physics majors (1995 Fall, 1996 Fall, 1997 Fall)
Introduction to Solid State Physics -- for upper class undergraduates and graduate students from Physics as well as Chemistry and Engineering (1994 & 1995 Spring)

Living in the Modern Age: from Bubble Gum to Fiber Optics -- I conceived, designed, and taught this course twice. This course was offered in a seminar format for non-science major undergraduates. The goal is to show them the comforts and conveniences of daily life that were made possible by modern technological materials. Topics included plastics and polymers, aluminum soda cans, silicon and integrated circuits, bar codes and diode lasers, optical fibers and telecommunications. The impact on society and environment, such as waste and recycling, was also examined. Class participation and a term paper are two major components of the course. For the latter, students chose a material and analyzed their materials properties and applications. The principle behind this term paper was to provide students with an opportunity to learn about the making and impact of a material of their interest. (1993 & 1994 Fall)

UNIVERSITY SERVICES:

SERVICES AT UNIVERSITY OF VIRGINIA:

Physics Department:

Graduate Program Advisor: 1994-1998
Supervised Prof. R. V. Coleman's 3 PhD students after his sudden death in December 1994.
Research Support Facilities Committee: 1993-1994
Colloquium Speakers Committee: 1993-1994, 1997-1998 (chair)
Condensed Matter Seminars Committee: 1993-1994
Graduate Program Committee: 1994-1999
Engineering Physics Program Committee: 1994-1996
Planning Committee: 1996-1999
Ph.D. Dissertation Committees of Q. Xue, Y. P. Gong, and E. D. Brandner

University Wide:

Dean of Arts and Sciences Search Committee: 1996-1997
Faculty advisor for Materials Research Society University of Virginia Chapter: 1998-1999
Equal Opportunity/Affirmative Action Committee: 1997-1998
MS Dissertation Committee of M. V. Moore (MSE) and J. E. Sweitzer (MSE)
Ph.D. Dissertation Committees of E. Knapp (Environ. Sci.) and of M. Mangan (MSE)

SERVICES AT UNIVERSITY OF TEXAS AT DALLAS:

MSE Department:

Associate Head: 2011-present
Graduate Director: 2011-present
Recruiting talks: 2015-16
Personnel Affairs Committee: 2010-2011
Colloquium Committee: 2010-14
Outreach Committee: 2010 (chair)
Public Relations Committee: 2010
Faculty Search Committee: 2011-12
Qualifying Exam Committee: 2013-2016

Erik Jonsson School of Engineering:

ECS Administrative Committee: 2013-2016
ECS Academic Affairs Committee: 2015-2016

University Wide:

Advisory Committee on Research (2012-2014)
C. Hinkle's 3rd year review Ad hoc committee: 2011
J. Y. Kim's promotion Ad hoc committee: 2012 (Chair)

M. Quevedo-Lopez's 3rd year review Ad hoc committee: 2012
Jie Zheng's tenure Ad hoc committee: 2013

OUT-REACH ACTIVITIES:

- Career Day talk at Wilson Middle School: 2010-2011
- Results featured in March 2009 issue of *Sandia Science Matters*
- Results featured in January 2009 issue of *Center of Integrated Nanotechnologies Highlights*
- Results featured on the cover and inside 2007 *Sandia LDRD Brochure*
- Features in *Sandia Technology* vol 9 (4)
- Featured in 2004 *New Mexico Women* magazine
- Featured in 2002 *Physics in Your Future* published by the American Physical Society
- Give tours of my laboratory and UVA Physics Department to students from nearby junior and high schools and community colleges

PUBLICATIONS

1. R. Yue, Y. Nie, L. A. Walsh, R. Addou, C. Liang, N. Lu, A. T. Barton, H. Zhu, Z. Che, D. Barrera, L. Cheng, P.-R. Cha, M. J. Kim, **J. W. P. Hsu**, J. Kim, L. Colombo, Y. J. Chabal, R. M. Wallace, K. Cho, and C. L. Hinkle, "Nucleation and Growth of WSe_2: Enabling Larger Grain Transition metal Dichalcogenides," submitted to Nat. Comm. (5/2017)
2. D. Barrera, A. Jawaid, T. B. Daunis, L. Cheng, Q. Wang, Y.-J. Lee, M. J. Kim, J. Kim, R. A. Vaia, and **J. W. P. Hsu**, "Inverted OPVs with MoS_2 Hole Transport Layer deposited by Spray Coating," to appear in Materials Today Energy (6/2017)
3. L. Xu, J. Wang, and **J. W. P. Hsu**, "Structural Order: the Dominant Factor for Non-geminate Recombination in Organic Photovoltaic Devices," J. Phys. Chem. C, 121, 9242-9248 (2017) 10.1021/acs.jpcc.7b03183
4. T. B. Daunis, G. Futierrez-Heredia, O. Rodriguez-Lopez, J. Wang, W. E. Voit, and **J. W. P. Hsu**, "Solution-deposited Al_2O_3 dielectric towards Fully-patterned Thin Film Transistors on Shape Memory Polymer," Proceedings of SPIE, Oxide-based Materials and Devices VIII, **10105**, 101051Z (2017)
5. M. D. Womble, J. Herbsommer, Y.-J. Lee, and **J. W. P. Hsu**, "Understanding the Source of Dielectric Loss in Titania/Polypropolyne Nanocomposites up to 220 GHz," Proceedings of SPIE, Optical Interconnects XVII, **10109**, 1010908 (2017)
6. S. Thampy, Y. Zheng, S, Dillon, C. Liu, Y. Jangjou, Y.-J. Lee, W. S. Epling, K. Xiong, Y. J. Chabal, K. Cho, and **J. W. P. Hsu**, "Superior Catalytic Performance of Mn-Mullite over Mn-Perovskite for NO Oxidation," to appear in Catalysis Today (2017) 10.1016/j.cattod.2017.05.008
7. R. Longo, R. Addou, KC Santosh, Ji-young Noh, C. Smyth, D. Barrera, **J. W. P. Hsu**, R. M. Wallace, K. Cho, "Intrinsic Air Stability Mechanisms of Two-Dimensional Transition Metal Dichalcogenide Surfaces: Basal vs. Edge Oxidation," 2D Materials 4, 025050 (2017) 10.1088/2053-1583/aa636c
8. D. Barrera, Q. Wang, Y.-J. Lee, L. Cheng, M. J. Kim, J. Kim, and **J. W. P. Hsu**, "Solution Synthesis of Few-layer 2H MX_2 (M=Mo,W;X=S,Se)," J. Mater. Chem. C **5**, 2859-2864 (2017) 10.1039/C6TC05097B
9. J. Wang, L. Xu, B. Zhang, Y.-J. Lee, and **J. W. P. Hsu**, "N-type Doping Induced by Electron Transport Layer in Organic Photovoltaic Devices," Adv. Electron. Mater. **3**, 1600458 (2017) 10.1002/aelm.201600458
10. L. Xu, J. Wang, and **J. W. P. Hsu**, "Transport Effects on Capacitance-Frequency Analysis for Defect Characterization in Organic Photovoltaic Devices," Phys. Rev. Applied **6**, 064020 (2016) 10.1103/PhysRevApplied.6.064020
11. L. Xu, J. Wang, M. De Anda Villa, T. B. Daunis, Yun-Ju Lee, A. V. Malko, and **J. W. P. Hsu**, "Quantitative Analyses of Competing Photocurrent Generation Mechanisms in Fullerene-based Organic Photovoltaics," J. Phys. Chem. C **120**, 16470-16477 (2016) 10.1021/acs.jpcc.6b05044
12. S. Thampy , V. Ibarra , Y.-J. Lee , G. McCool , K. Cho , and **J. W.P. Hsu**, "Effect of Synthesis Conditions on Structure and NO Adsorption Properties of $SmMn_2O_5$," Appl. Surf. Sci. **385**, 490-497 (2016) 10.1016/j.apsusc.2016.05.151
13. L. Tzabari, J. Wang, Y.-J. Lee, **J. W. P. Hsu**, and N. Tessler, "Role of Contact Injection, Exciton Dissociation and Recombination – Revealed Through Voltage and Intensity Mapping of the Quantum Efficiency of Polymer:Fullerene Solar Cells," J. Phys. Chem. C **120**, 10146-10155 (2016) 10.1021/acs.jpcc.6b01239
14. J. Wang, Y.-J. Lee, and **J. W. P. Hsu**, "Sub-10 nm Copper Chromium Oxide Nanocrystals as Solution Processed p-Type Hole Transport Layer for Organic Solar Cells," J. Mater. Chem. C **4**, 3607-3613 (2016) 10.1039/c6tc00541a
15. C. Li, S. Thampy, Y. Zheng, M. Kweun, Y. Ren, J. Y. Chan, H. Kim, M. Cho, Y. Y. Kim, **J. W.P. Hsu**, and K. Cho, "Thermal Stability of Mullite RMn_2O_5 (R = Bi, Y, Gd, Pr, or Sm): Combined Density Functional Theory and Experimental Study," J. Phys.: Condens. Matter **28**, 125602 (2016) 10.1088/0953-8984/28/12/125602
16. J. Huang, A. T. Lucero, H. Zhang, L. Cheng, S, KC, J. Wang, M. Quevedo-Lopez, **J. W. P. Hsu**, K. Cho, and J. Kim, "Organic-Inorganic Hybrid Semiconductor Thin Films Deposited using

Molecular-Atomic Layer Deposition (MALD)," J. Mater. Chem. C **4**, 2382-2389 (2016) 10.1039/c5tc03714j

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1. **J. W. P. Hsu** and J. Wang, "Room-temperature Deposition of Interfacial Contact Layers for Organic Photovoltaics," SPIE Newsroom (2016) 10.1117/2.1201608.006631
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Patents:

1. **J. W. P. Hsu** and J. Liu, "Directed Spatial Organization of Zinc Oxide Nanostructures," US Patent #7,491,423 (February 17, 2009)
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3. **J. W. P. Hsu** and M. J. Manfra, "Apparatus with Improved Layers of Group III-Nitride Semiconductor," US Patent #7,038,300 (May 2, 2006)
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5. **J. W. P. Hsu**, Mark Lee, and B. S. Deaver, "Nanometer Distance Regulation Using Electro-mechanical Power Dissipation," US Patent #5,886,532 (March 23, 1999)

INVITED TALKS AND CONFERENCES

INVITED TALKS:

1. "INORGANIC NANOPARTICLES FOR ORGANIC PHOTOVOLTAICS," Institute of Textiles and Clothing, Hong Kong Polytechnic University, Hong Kong, China, January 2017
2. "UNINTENTIONAL DOPING INDUCED BY TRANSPORT LAYER IN ORGANIC PHOTOVOLTAIC DEVICES," Department of Physics, Chinese University of Hong Kong, Hong Kong, China, January 2017
3. "UNINTENTIONAL DOPING INDUCED BY TRANSPORT LAYER IN ORGANIC PHOTOVOLTAIC DEVICES," Department of Electrical Engineering, the University of Hong Kong, Hong Kong, China, January 2017
4. "CRITERIA FOR EFFICIENT HOLE TRANSPORT LAYER MATERIALS FOR ORGANIC PHOTOVOLTAICS," Department of Physics and Materials Science, Hong Kong City University, Hong Kong, China, January 2017
5. "SOLUTION SYNTHESIS OF INORGANIC NANOPARTICLES," Department of Chemistry, National Taiwan Normal University, Taipei, Taiwan, January 2017
6. "CRITERIA FOR EFFICIENT HOLE TRANSPORT LAYER MATERIALS FOR ORGANIC PHOTOVOLTAICS," Center for Condensed Matter Sciences, National Taiwan University, Taipei, Taiwan, January 2017
7. "INORGANIC NANOPARTICLES FOR ORGANIC PHOTOVOLTAICS," Department of Applied Chemistry, National Chiao Tung University, Hsinchu, Taiwan, January 2017
8. "MATERIALS SCIENCE AND ENGINEERING: FOUNDATION OF ENGINEERING FUTURE," Department of Mechanical Engineering and Materials Science, Yale University, New Haven, CT, December 2016
9. "INORGANIC NANOPARTICLES FOR ORGANIC PHOTOVOLTAICS," Department of Materials Science and Engineering, Kookmin University, Seoul, South Korea, November 2016
10. "EFFECTS OF CONTACT-INDUCED DOPING ON ORGANIC PHOTOVOLTAIC DEVICE PERFORMANCE," 2016 International Conference on Electronic Materials and Nanotechnology for Green Environment (ENGE), Jeju, South Korea, November 2016
11. "INORGANIC NANOPARTICLES FOR ORGANIC PHOTOVOLTAICS," Department of Materials Science and Engineering, Seoul National University, Seoul, South Korea, November 2016
12. "UNINTENTIONAL DOPING INDUCED BY TRANSPORT LAYER IN ORGANIC PHOTOVOLTAIC DEVICES," Institute of Applied Physics, Seoul National University, Seoul, South Korea, November 2016
13. "INORGANIC NANOPARTICLES FOR ORGANIC PHOTOVOLTAICS," Electrical and Computer Engineering, University of Virginia, Charlottesville, VA, April 2016
14. "UNIVERSITY OF TEXAS AT DALLAS MATERIALS SCIENCE AND PHYSICS DEPARTMENTS," Society of Physics Students, University of Virginia, Charlottesville, VA, April 2016
15. "P-TYPE DELAFOSSITE NANOPARTICLES AS HOLE TRANSPORT LAYER FOR ORGANIC PHOTOVOLTAICS," Photonic West, San Francisco, CA, February 2016
16. "SOLUTION SYNTHESIS OF METAL OXIDE NANOPARTICLES AS CHARGE TRANSPORT LAYER MATERIALS FOR ORGANIC PHOTOVOLTAICS," Department of Applied Physics, Stanford University, Stanford, CA, February 2016
17. "NANOCOMPOSITES FOR DIELECTRIC WAVEGUIDES: IDEAS AND CHALLENGES," Kirby Lab, Texas Instruments, Dallas, TX, January 2016
18. "EFFECT OF INTERFACIAL CONTACT LAYERS ON ORGANIC PHOTOVOLTAIC DEVICE PERFORMANCE," Seventh Electronic Structure and Processes at Molecular based Interfaces, Rehovoth, Israel, April 2013
19. "SOLUTION SYNTHESIZED METAL OXIDE NANOPARTICLES AS INTERFACIAL CONTACT LAYER AND MEASURING BIMOLECULAR RECOMBINATION IN ORGANIC PHOTOVOLTICS," National Renewable Energy Laboratory, Golden, CO, January 2013

20. "QUANTIFYING BIMOLECULAR RECOMBINATION IN ORGANIC SOLAR CELLS USING WHITE LIGHT BIAS EXTERNAL QUANTUM EFFICIENCY MEASUREMENT," 2012 Fall Materials Research Society Meeting, Boston, MA, November 2012
21. "EFFECT OF INTERFACIAL CONTACT LAYERS ON THE ORGANIC PHOTOVOLTAIC DEVICE PERFORMANCE," Department of Electrical Engineering Colloquium, University of Texas at Arlington, Arlington, TX, November 2012
22. "IMPACT OF INTERFACIAL CONTACT LAYERS ON BIMOLECULAR RECOMBINATION IN ORGANIC SOLAR CELLS," International Organic Excitonic Solar Cells Conference, Coolum Beach, Australia, September 2012
23. "SOLUTION PROCESSED MOLYBDENUM OXIDE NANOPARTICLES FOR ROOM-TEMPERATURE DEPOSITION OF HOLE TRANSPORT LAYER IN ORGANIC SOLAR CELLS + OVERVIEW OF UT DALLAS MSE DEPARTMENT," National Dong Hwa University, Hualien, Taiwan, June 2012
24. "SOLUTION PROCESSED MOLYBDENUM OXIDE NANOPARTICLES FOR ROOM-TEMPERATURE DEPOSITION OF HOLE TRANSPORT LAYER IN ORGANIC SOLAR CELLS + OVERVIEW OF UT DALLAS MSE DEPARTMENT," National Taiwan University, Taipei, Taiwan, May 2012
25. "LOW-TEMPERATURE OXIDE NANOPARTICLE SUSPENSIONS TO ENHANCE CARRIER COLLECTION IN ORGANIC PHOTOVOLTAICS," Telluride Workshop on Interfacial Phenomena in Nanostructured Materials and Devices, Telluride, CO, February 2012
26. "ENHANCED OPTICAL ABSORPTION IN POLYMER SOLAR CELLS WITH PLASMONIC NANOSTRUCTURES," 4th annual CONTACT Review, Dayton, OH, November 2011
27. "SOLUTION SYNTHESIZED METAL OXIDE TRANSPORT LAYERS FOR ORGANIC PHOTOVOLTAIC DEVICES," Air Force Research Laboratory, Dayton, OH, November 2011
28. "ORGANIC/HYBRID SOLAR CELLS: MEASURING BAND-ALIGNMENT UNDER DEVICE PROCESSING CONDITIONS + OVERVIEW OF UT DALLAS MSE DEPARTMENT," National Cheng Kung University, Tainan, Taiwan, June 2011
29. "ORGANIC/HYBRID SOLAR CELLS: MEASURING BAND-ALIGNMENT UNDER DEVICE PROCESSING CONDITIONS + OVERVIEW OF UT DALLAS MSE DEPARTMENT," National Tsing Hwa University, Hsinchu, Taiwan, June 2011
30. "ORGANIC/HYBRID SOLAR CELLS: MEASURING BAND-ALIGNMENT UNDER DEVICE PROCESSING CONDITIONS + OVERVIEW OF UT DALLAS MSE DEPARTMENT," National Taiwan University, Taipei, Taiwan, May 2011
31. "BULK HETEROJUNCTION MORPHOLOGY AND INTERFACIAL STRENGTH IN ORGANIC PHOTOVOLTAICS," 7th annual workshop of the NSF Center for Probing the Nanoscale, Stanford, CA, May 2011
32. "DETERMINATION OF ENERGY LEVEL ALIGNMENT AT INTERFACES OF HYBRID AND ORGANIC SOLAR CELLS UNDER AMBIENT ENVIRONMENT," 2011 Spring MRS Meeting, San Francisco, CA, April 2011
33. "SOLUTION-SYNTHESIZED ZnO NANOMATERIALS FOR HYBRID SOLAR CELLS," TMS 2011, 140th Annual Meeting, San Diego, CA, March 2011
34. "ORGANIC/HYBRID SOLAR CELLS: CURRENT STATE AND FUTURE CHALLENGES," Texas Instruments, Dallas, TX, January 2011
35. "ENHANCED OPTICAL ABSORPTION IN POLYMER SOLAR CELLS WITH PLASMONIC NANOSTRUCTURES," 3rd annual CONTACT Review, Houston, TX, October 2010
36. "IMPROVED HYBRID PHOTOVOLTAICS DEVICE PERFORMANCE THROUGH OXIDE ENGINEERING," SPIE Optics + Photonics, San Diego, August, 2010
37. "INTERFACIAL MODIFICATIONS IN ORGANIC OPTOELECTRONIC DEVICES," CITMEC 2010, 5th Forum on New Materials, Montecatini, Italy, June, 2010
38. "CHARGE TRANSFER BETWEEN ORGANIC FILMS AND SUBSTRATES," Telluride Workshop on Interfacial Phenomena in Nanostructured Materials and Devices, Telluride, CO, February 2010
39. "SOLUTION GROWTH OF ZnO NANOSTRUCTURES FOR ENERGY APPLICATIONS," TACT 2009 International Thin Films Conference, Taipei, Taiwan, December, 2009

40. "STRATEGIES TO IMPROVE EFFICIENCY IN POLYMER-METAL OXIDE SOLAR CELLS," Invited Lecture, Academic Taipei, Taiwan, December, 2009
41. "DEGRADATION MECHANISM IN AIR FOR ORGANIC SOLAR CELLS," Condensed Matter Seminar, National Taiwan University, Taipei, Taiwan, December, 2009
42. "MATERIALS CHALLENGES IN NANOSTRUCTURED ZnO/CONJUGATED POLYMER PHOTOVOLTAIC DEVICES," 2009 Fall MRS Meeting, Boston, MA, December, 2009
43. "Shelf Life and Degradation Mechanism in Air of Organic Solar Cells," Organic Photovoltaics Summit, Boston, MA, October, 2009
44. "RECENT PROGRESSES IN ZnO/CONJUGATED POLYMER PHOTOVOLTAIC DEVICES," New Mexico AVS Symposium, Albuquerque, NM, May, 2009
45. "MATERIALS CHALLENGES IN NANOSTRUCTURED ZnO/CONJUGATED POLYMER PHOTOVOLTAIC DEVICES," NIST Seminar, Gaithersburg, MD, April, 2009
46. "MATERIALS CHALLENGES IN NANOSTRUCTURED ZnO/CONJUGATED POLYMER PHOTOVOLTAIC DEVICES," Materials Science and Engineering Seminar, Rensselaer Polytechnic Institute, Troy, NY, April, 2009
47. "MATERIALS CHALLENGES IN NANOSTRUCTURED ZnO/CONJUGATED POLYMER PHOTOVOLTAIC DEVICES," Materials Science and Engineering Colloquium, University of Florida, Gainsville, FL, March, 2009
48. "EFFECT OF INTERFACE MODIFICATIONS ON CONDUCTING POLYMER – OXIDE SOLAR CELLS," Chemical Reactions at Surfaces Gordon Research Conference, Ventura, CA, February, 2009
49. "MATERIALS CHALLENGES IN NANOSTRUCTURED ZnO/CONJUGATED POLYMER PHOTOVOLTAIC DEVICES," Materials Science and Engineering Seminar, University of Texas - Dallas, Dallas, TX, February, 2009
50. "MATERIALS CHALLENGES IN NANOSTRUCTURED ZnO/CONJUGATED POLYMER PHOTOVOLTAIC DEVICES," Seminar, Cornell Univeristy, Ithaca, NY, November 2008
51. "PERSPECTIVES ON A RESEARCH CAREER AT A NATIONAL LABORATORY – FROM THE POINT OF VIEW OF SOMEONE WHO HAS ALSO WORKED AT AN INDUSTRIAL LABORATORY AND AT A RESEARCH UNIVERSITY," Seminar, Cornell Univeristy, Ithaca, NY, November 2008
52. "ZnO NANOSTRUCTURES FOR SOLAR ENERGY UTILIZATION," 214th ECS Biannual Meeting, Honolulu, HI, October, 2008
53. "MATERIALS CHALLENGES IN NANOSTRUCTURED ZnO/CONJUGATED POLYMER PHOTOVOLTAIC DEVICES," 2008 MRS International Materials Research Conference, Chongqing, China, June, 2008
54. "HETEROEPITAXIAL GROWTH OF ZnO NANORODS ON SILVER: PATTERNED GROWTH, HETEROEPITAXY, NANOSCALE PIEZOELECTRIC AND ELECTRICAL PROPERTIES," 7th International Workshop on Epitaxial Semiconductors on Patterned Substrates and Novel Index Surfaces, Marseille, France, April, 2008
55. "INTERFACIAL CHARGE TRANSFER IN CONJUGATED POLYMER/ZnO PHOTOVOLTAIC DEVICES," Telluride Workshop on Interfacial Phenomena in Nanostructured Materials and Devices, Telluride, CO, February 2008
56. "IMAGING CONDUCTING PATHS IN CNT POLYMER NANOCOMPOSITES," Dielectric Polymer Nanocomposite Workshop, Dayton, OH, June, 2007
57. "EFFECT OF INTERFACIAL MODIFICATION ON POLYMER-OXIDE PHOTOVOLTAICS," International Institute for Complex Adaptive Matter (ICAM) and the Center for Integrated Nanotechnologies (CINT) Workshop on Energy Transfer: from the Nanoscale to the Macroscale, Sante Fe, NM, March, 2007
58. "NANOSTRUCTURED MATERIALS FOR SOLAR ENERGY HARVESTING," Washington University, EEC Department Seminar, St. Louis, MO, February, 2007
59. "PIEZOELECTRIC AND LUMINESCENT PROPERTIES OF ZnO NANOSTRUCTURES ON Ag FILMS," the Materials Research Society Fall Meeting, Boston, MA, November, 2006
60. "INTERFACIAL TRANSPORT PROPERTIES IN METAL/MOLECULE/SEMICONDUCTOR DIDOES," the AVS 53rd International Symposium, San Francisco, CA, November, 2006

61. "FORMING MOLECULAR MONOLAYERS AND MOLECULAR DIODES ON GaAs," the Telluride Workshop on Functional Modification of Semiconductor Surfaces, Telluride, CO, August, 2006
62. "EFFECT OF SUBSTRATES ON HETERONUCLEATION OF ZnO NANORODS," the Telluride Workshop on Functional Modification of Semiconductor Surfaces, Telluride, CO, August, 2006
63. "FORMING MOLECULAR MONOLAYERS AND MOLECULAR DIODES ON GaAs," the Materials Research Society Spring Meeting, San Francisco, CA, April, 2006
64. "GROWTH, ASSEMBLY, AND CHARACTERIZATION OF ZnO NANOSTRUCTURES," the American Physics Society March Meeting, Baltimore, MD, March, 2006
65. "ORGANIC-ELECTRODE INTERFACE IN A METAL-MOLECULE-SEMICONDUCTOR SYSTEM," University of Tokyo, Institute for Solid State Physics, Kashiwa-shi, Japan, March 2006
66. "BALLISTIC ELECTRON EMISSION MICROSCOPY STUDIES OF TRANSPORT THROUGH MOLECULAR LAYERS," Electronic Structure and Processes of Molecular-Based Interfaces (ESPMI 06), Nagoya, Japan, March, 2006
67. "BALLISTIC ELECTRON EMISSION MICROSCOPY STUDIES OF MOLECULAR DIODES," the Materials Research Society Fall Meeting, Boston, MA, December, 2005
68. "GROWTH AND ASSEMBLY OF COMPLEX ZINC OXIDE NANOSTRUCTURES," Princeton Institute for the Science and Technology of Materials (PRISM) seminar, Princeton, NJ, November, 2005
69. "NOVEL NANOLITHOGRAPHY: APPLICATIONS TO PHOTONICS, ELECTRONICS, AND NANOMATERIAL ASSEMBLY," Meeting of the Association of Chinese Engineers and Scientists NM Chapter, Albuquerque, NM, October, 2005
70. "GROWTH AND ASSEMBLY OF COMPLEX ZINC OXIDE NANOSTRUCTURES," Wright Patterson Air Force Research Laboratories, Dayton, OH, September, 2005
71. "PATTERNING FUNCTIONAL OXIDES BY SOFT NANOLITHOGRAPHY," Sixth Pacific Rim Conference on Glass and Ceramic Technology, Maui, HI, September, 2005
72. "GROWTH AND ASSEMBLY OF COMPLEX INORGANIC NANOSTRUCTURES," Rocky Mountain Chapter of AVS Symposium, Golden, CO, August, 2005
73. "BALLISTIC ELECTRON EMISSION MICROSCOPY STUDIES OF METAL-MOLECULAR-SEMICONDUCTOR DIODES," Third International Conference on Materials for Advanced Technologies (ICMAT 2005), Singapore, July, 2005
74. "GROWTH AND ASSEMBLY OF INORGANIC NANOSTRUCTURES," National Renewal Energy Laboratory, Golden, CO, April, 2005
75. "BOTTOM-UP ASSEMBLY OF ZnO NANORODS ON SURFACES USING ORGANIC TEMPLATES," the 229th American Chemical Society Annual Meeting, San Diego, CA, March, 2005
76. "BALLISTIC ELECTRON EMISSION MICROSCOPY STUDIES OF Au-OCTANEDITHIOL-GaAs DIODES," Engineering Conference International, Molecular-scale Electronics, San Diego, CA, January, 2005
77. "ELECTRICAL TRANSPORT IN A METAL-MOLECULE-SEMICONDUCTOR SYSTEM," Nano Science and Engineering Center Seminar, Columbia University, New York, NY, October, 2004
78. "SPATIAL ORGANIZATION OF ZnO NANO-RODS ON SURFACES USING ORGANIC TEMPLATES," SPIE's International Symposium on Photonic East, Philadelphia, PA, October, 2004
79. "BALLISTIC ELECTRON EMISSION MICROSCOPY STUDIES OF METAL-MOLECULE-SEMICONDUCTOR DIODES," Seminar, University of Minnesota, Minneapolis, MN. September, 2004
80. "BALLISTIC ELECTRON EMISSION MICROSCOPY STUDIES OF METAL-MOLECULE-SEMICONDUCTOR DIODES," Molecular Conduction Workshop, Northwestern University, Evanston, IL, July 2004
81. "MAKING ELECTRICAL CONTACTS TO ORGANIC MATERIALS BY SOFT LITHOGRAPHY," 45th Electronic Materials Conference, South Bend, IN, June 2004
82. "SURFACE CHEMICAL ROUTE TO CONTROL ZnO NUCLEATION ON METAL AND GaAs," the ONR workshop on Frontiers of Epitaxy, Moab, UT, May, 2004

83. "NEAR-FIELD SCANNING OPTICAL MICROSCOPY STUDIES OF NANOSTRUCTURED SiN MEMBRANES," the American Chemical Society Annual Meeting, Anaheim, CA, March, 2004
84. "MAKING ELECTRICAL CONTACTS TO MOLECULAR LAYERS BY NANOTRANSFER PRINTING," the American Physical Society March Meeting, Montreal, Canada, March, 2004
85. "ORGANIC PHOTONICS AND ELECTRONICS BY SOFT NANOLITHOGRAPHY," Colloquium, Argonne National Laboratories, Argonne, IL, March, 2004
86. "ELECTRICAL TRANSPORT THROUGH ALKANEDITHIOL MOLECULES CHEMICALLY BONDED TO Au AND GaAs," Sandia National Laboratories, Livermore, CA, February, 2004
87. "NANO-PHOTONICS: CURRENT TECHNOLOGIES AND FUTURE CHALLENGES," and "SCANNING PROBE BASED ELECTRICAL MEASUREMENTS," kick-off talk in nano-electronics, photonics, and magnetics break-out session at Special National Nanotechnology Initiative (NNI) Interagency Grand Challenge Workshop on Instrumentation and Metrology at NIST, Gaithersburg, MD, January, 2004
88. "HIGH PERFORMANCE ORGANIC LIGHT EMITTING DIODES WITH LAMINATED Au ELECTRODES," the Materials Research Society Fall Meeting, Boston, MA, December, 2003
89. "ELECTRICAL TRANSPORT THROUGH ALKANEDITHIOL MOLECULES CHEMICALLY BONDED TO Au AND GaAs," Hewlett Packard Labs, Palo Alto, CA, October, 2003
90. "ELECTRICAL TRANSPORT THROUGH ALKANEDITHIOL MOLECULES CHEMICALLY BONDED TO Au AND GaAs," Molecular Conduction Workshop, Purdue University, West Lafayette, IN, July 2003
91. "ELECTRICAL TRANSPORT IN A METAL-MOLECULE-SEMICONDUCTOR SYSTEM," Rutgers University, Surface Science Seminar, New Brunswick, NJ, May, 2003
92. "SOFT NANOLITHOGRAPHY FOR PHOTONICS AND ELECTRONICS," University of California - Berkeley, Department of Materials Science and Engineering, Berkeley, CA, April, 2003
93. "MAPPING TRANSCONDUCTANCE VARIATION IN AlGaN/GaN HIGH ELECTRON MOBILITY TRANSISTORS BY SCANNING GATE MICROSCOPY," the ONR workshop on Defect Characterization Techniques in Wide Gap Semiconductors, Maui, Hawaii, March, 2003
94. "PHOTONICS AND ELECTRONICS AT THE NANOMETER SCALE," Northwestern University, Materials Science and Engineering, Evanston, IL, February, 2003
95. "PHOTONICS AND ELECTRONICS AT THE NANOMETER SCALE," Princeton University, Electrical Engineering, Princeton, NJ, February, 2003
96. "NOVEL NANOFABRICATION FOR PHOTONICS AND ELECTRONICS," University of Minnesota, Electrical and Computer Engineering, Minneapolis, MN, February, 2003
97. "ELECTRICAL TRANSPORT THROUGH A MOLECULAR LAYER CHEMICALLY BONDED ON GaAs SURFACES," 30th Conference on the Physics and Chemistry of Semiconductor Interfaces, Salt Lake City, UT, January, 2003
98. "SCANNING PROBE STUDIES OF DEFECT CONTROLLED ELECTRONIC TRANSPORT IN III-NITRIDE FILMS," Purdue University, Materials Engineering, West Lafayette, IN, December, 2002
99. "PHOTONICS AND ELECTRONICS AT THE NANOMETER SCALE," Condensed Matter Seminar, UC-San Diego, La Jolla, CA, November, 2002
100. "NANOSCALE PHOTONICS AND MOLECULAR ELECTRONICS," Sandia National Laboratories, Albuquerque, NM, October, 2002
101. "SCANNING PROBE STUDIES OF DEFECT CONTROLLED ELECTRONIC TRANSPORT IN III-NITRIDE FILMS," Penn State University, Materials Science and Engineering, State College, PA, October, 2002
102. "SCANNING PROBE STUDIES OF DEFECT CONTROLLED ELECTRONIC TRANSPORT IN III-NITRIDE FILMS," the 14th American Conference on Crystal Growth and Epitaxy, Seattle, WA, August, 2002
103. "PHYSICS AND ME" Bell Laboratories Women Summer Students Networking Luncheon, Murray Hill, NJ, July, 2002
104. "NANOSCALE IMAGING OF DEFECT CONTROLLED ELECTRONIC TRANSPORT IN III-NITRIDES," Naval Research Laboratories, Washington, DC, May, 2002

105. "DISLOCATION ELECTRICAL ACTIVITY IN III-NITRIDES," the American Physical Society March Meeting, Indianapolis, IN, March, 2002
106. "DISLOCATION ELECTRICAL ACTIVITY IN GaN," the ONR workshop on Extended Defects in Wide Gap Semiconductors: Electrical and Optical Effects, Belize, January, 2002
107. "NEAR-FIELD SCANNING OPTICAL IMAGING OF PHOTONIC STRUCTURES," Institute of Atomic and Molecular Sciences, Academic Sinica, Taipei, Taiwan, December, 2001
108. "NANOSCALE IMAGING OF DEFECT CONTROLLED ELECTRONIC TRANSPORT IN III-NITRIDE FILMS," Institute of Applied Science and Engineering Research, Academic Sinica, Nankang, Taiwan, December, 2001
109. "STRUCTURAL PROPERTIES AND ELECTRICAL BEHAVIOR OF GaN DISLOCATIONS," the Materials Research Society Fall Meeting, Boston, MA, November, 2001
110. "SCANNING PROBE STUDIES OF OPTOELECTRONIC MATERIALS," Sandia National Laboratories, Albuquerque, NM, November, 2001
111. "SCANNING PROBE STUDIES OF OPTOELECTRONIC MATERIALS," University of Wisconsin, Madison, WI, September, 2001
112. "SCANNING PROBE STUDIES OF OPTOELECTRONIC MATERIALS," National Institute of Standards and Technology, Boulder, Co, August, 2001
113. "SCANNING PROBE STUDIES OF ELECTRONIC AND PHOTONIC MATERIALS," University of Colorado, Condensed Matter Seminar, Boulder, Co, August, 2001
114. "SCANNING PROBE STUDIES OF ELECTRONIC AND PHOTONIC MATERIALS," Stanford University, Condensed Matter Seminar, Stanford, CA, April, 2001
115. "SCANNING PROBE STUDIES OF DEFECT DOMINATED ELECTRONIC TRANSPORT IN GaN," the 199th Meeting of the Electrochemical Society, Washington, DC, March, 2001
116. "SCANNING PROBE STUDIES OF DEFECT INDUCED ELECTRONIC TRANSPORT IN GaN," Carnegie Mellon University, Department of Materials Science and Engineering, Pittsburgh, PA, March, 2001
117. "SCANNING PROBE STUDIES OF DEFECT INDUCED ELECTRONIC TRANSPORT IN GaN," Pennsylvania State University, Department of Physics, State College, PA, November, 2000
118. "SEMICONDUCTOR DEFECT STUDIES USING SCANNING PROBES," Annual Meeting of the Microscopy Society of America, Philadelphia, PA, August, 2000
119. "NEAR-FIELD PHOTOCURRENT STUDIES OF DISLOCATION ELECTRICAL ACTIVITY IN RELAXED GeSi FILMS," Materials Research Society Fall Meeting, Boston, MA, December, 1999
120. "NANOMETER-SCALE STUDIES OF DEFECTS IN SOLIDS USING NEAR-FIELD SCANNING OPTICAL MICROSCOPY," University of Pennsylvania, Philadelphia, PA, October, 1999
121. "MICROSTRUCTURAL DEFECTS IN $SrTiO_3$ BICRYSTALS AND THEIR INFLUENCE ON $YBa_2Cu_3O_7$ GRAIN BOUNDARY JUNCTIONS," Gordon Conferences, August, 1999
122. "SCANNING PROBE MICROSCOPY STUDIES OF GaAs/Ge FILMS," University of Virginia, Materials Science and Engineering Department, Charlottesville, VA, December, 1998
123. "NANOSCALE SCANNING PROBE STUDIES OF DEFECTS IN HETEROEPITAXIAL SYSTEMS," Bell Labs, Lucent Technologies, Inc., Murray Hill, NJ, November 1998
124. "OPTICAL MICROSCOPY AND SPECTROSCOPY BEYOND THE DIFFRACTION LIMIT," Ohio Section of American Physical Society Meeting, Akron, OH, October, 1998
125. "NANOSCALE SCANNING PROBE STUDIES OF DEFECTS IN HETEROEPITAXIAL SYSTEMS," Ohio State University, Columbus, OH, October, 1998
126. "NANOSCALE SCANNING PROBE STUDIES OF DEFECTS IN HETEROEPITAXIAL SYSTEMS," University of Wisconsin, Madison, WI, September, 1998
127. "NEAR-FIELD SCANNING OPTICAL MICROSCOPY STUDIES OF INDIVIDUAL DISLOCATIONS IN RELAXED GeSi FILMS," Annual Meeting of the Microscopy Society of America, Atlanta, GA, July, 1998
128. "NANOSCALE STRUCTURE-PROPERTY STUDIES USING SCANNING PROBES," Massachusetts Institute of Technology, Cambridge, MA, January, 1998
129. "NEAR-FIELD SCANNING OPTICAL MICROSCOPY: PRINCIPLES AND APPLICATIONS," University of Virginia, Chemical Engineering Department, Charlottesville, VA, November, 1997

130. "NANOMETER-SCALE STUDIES OF DEFECTS IN SOLIDS USING NEAR-FIELD SCANNING OPTICAL MICROSCOPY," University of Rochester, Rochester, NY, October, 1997
131. "NANOMETER SCALE STUDIES OF DEFECTS IN SEMICONDUCTOR FILMS BY NEAR-FIELD OPTICAL BEAM INDUCED CURRENT," Defect Recognition and Image VII, Templin, Germany, September, 1997
132. "NEAR-FIELD SCANNING OPTICAL MICROSCOPY STUDIES OF LOCAL PHOTORESPONSE IN GeSi AND Cu(In,Ga)Se FILMS," National Renewable Energy Laboratory, Golden, CO, June, 1997
133. "NANOMETER-SCALE STUDIES OF DEFECTS IN SOLIDS USING NEAR-FIELD SCANNING OPTICAL MICROSCOPY," Bell Labs, Lucent Technologies, Inc., Murray Hill, NJ, June 1997
134. "OPTICAL MICROSCOPY BEYOND THE DIFFRACTION LIMIT," National Tsinghua University, Hsinchu, Taiwan, April, 1997
135. "NANOMETER-SCALE STUDIES OF DEFECTS IN SOLIDS USING NEAR-FIELD SCANNING OPTICAL MICROSCOPY," National Taiwan University, Taipei, Taiwan, April, 1997
136. "MICROSTRUCTURAL DEFECTS IN $SrTiO_3$ BICRYSTALS AND THEIR INFLUENCE ON $YBa_2Cu_3O_7$ GRAIN BOUNDARY JUNCTIONS," Materials Research Society Spring Meeting, San Francisco, CA, April, 1997
137. "NANOMETER SCALE DEFECT STUDIES USING NEAR-FIELD PHOTOCURRENT IMAGING," American Physical Society 1997 March Meeting, Kansas City, MO, March, 1997
138. "NEAR-FIELD SCANNING OPTICAL MICROSCOPY: SEEING THE LILLIPUTIANS' WORLD," Oregon State University, OR, January, 1997
139. "PROBING OPTICAL MODE STRUCTURES IN A PHOTONIC CRYSTAL USING A NEAR-FIELD SCANNING OPTICAL MICROSCOPE," Lasers and Electro-Optics Society Annual Meeting, Boston, MA, November, 1996
140. "NANOMETER-SCALE STUDIES OF DEFECTS IN SOLIDS USING NEAR-FIELD SCANNING OPTICAL MICROSCOPY," Boston University, Boston, MA, November, 1996
141. "NEAR-FIELD SCANNING OPTICAL MICROSCOPY: PRINCIPLES AND APPLICATIONS," University of Virginia, Biomedical Engineering Department, Charlottesville, VA, November, 1996
142. "NEAR-FIELD SCANNING OPTICAL MICROSCOPY: SEEING THE LILLIPUTIANS' WORLD," James Madison University, Harrisonburg, VA, October, 1996
143. "SCANNING PROBE MICROSCOPY STUDIES OF ELECTRICALLY ACTIVE DEFECTS IN LATTICE MISMATCHED FILMS," Scanning Microscopy Meeting, Bethesda, MD, May, 1996
144. "NEAR-FIELD SCANNING OPTICAL MICROSCOPY: PRINCIPLES AND APPLICATIONS," University of Virginia, Biophysics Seminar, Charlottesville, VA, March, 1996
145. "NEAR-FIELD SCANNING OPTICAL MICROSCOPY: SEEING THE LILLIPUTIANS' WORLD," Old Dominion University, Norfolk, VA, December, 1995
146. "PROBING NANOMETER MATERIALS PROPERTIES USING A NEAR-FIELD SCANNING OPTICAL MICROSCOPE," Hewlett-Packard Labs, Palo Alto, CA, October, 1995
147. "NEAR-FIELD SCANNING OPTICAL MICROSCOPY: SEEING THE LILLIPUTIANS' WORLD," Georgetown University, Georgetown, MD, September, 1995
148. "STUDIES OF SUBMICRON DEFECTS USING A NEAR-FIELD SCANNING OPTICAL MICROSCOPE (NSOM)," National Institute of Standards and Technology, Gaithersburg, MD, June, 1995
149. "NEAR-FIELD SCANNING OPTICAL MICROSCOPY (NSOM) STUDIES OF DEFECTS IN CRYSTALS," Academic Sinica, Taipei, Taiwan, April, 1995
150. "NEAR-FIELD SCANNING OPTICAL IMAGING OF DEFECTS ON GeSi FILMS," South-Eastern Section of American Physical Society Meeting, Newport News, VA. November, 1994
151. "SEEING THE LILLIPUTIANS' WORLD: SCANNING PROBE MICROSCOPY," William and Mary College, Williamsburg, VA, November, 1994
152. "NEAR-FIELD SCANNING OPTICAL AND SCANNING FORCE MICROSCOPY STUDIES OF SEMICONDUCTOR SURFACE DEFECTS AND MORPHOLOGY," University of Virginia, Department of Material Science and Engineering Colloquium, February, 1994

153. "NEAR-FIELD SCANNING OPTICAL AND SCANNING FORCE MICROSCOPY STUDIES OF SEMICONDUCTOR SURFACE DEFECTS AND MORPHOLOGY" and "PHOTOEXCITATION DYNAMICS IN POLY(PARA-PHENYLENE VINYLENE)S," Hewlett-Packard Company, Palo Alto, CA. January, 1994
154. "NEAR-FIELD SCANNING OPTICAL MICROSCOPY: PRINCIPLES AND APPLICATIONS," Industrial Technology Research Institute, Hsinchu, Taiwan, January, 1994
155. "PHOTOEXCITATION DYNAMICS IN POLY(PARA-PHENYLENE VINYLENE)S," Academic Sinica, Taiwan, Taipei, December, 1993
156. "PHOTOEXCITATION DYNAMICS IN POLY(PARA-PHENYLENE VINYLENE)S," Rutgers University, Piscataway, NJ, November, 1993
157. "PHOTOEXCITATION DYNAMICS IN POLY(PARA-PHENYLENE VINYLENE)S: INTERCHAIN VS. INTRACHAIN EFFECTS," 1993 American Physical Society March Meeting, Seattle, WA, March, 1993
158. "PHOTOGENERATED EXCITATIONS IN POLY(PARA-PHENYLENE VINYLENE)S," Xerox Webster Research Center, Webster, NY, October, 1992
159. "INTERPLAY BETWEEN SURFACE AND BULK PROPERTIES OF SEMICONDUCTORS: WHO IS IN CHARGE?" Cornell University & Princeton University, Ithaca, NY & Princeton, NJ, April, 1992
160. "DYNAMICS OF VORTEX STATE IN SUPERCONDUCTORS," Rutgers University, Piscataway, NJ, November, 1991
161. "VORTEX MOTION IN A TWO-DIMENSIONAL SINGLE CRYSTAL Nb FILM," National Institute of Standards and Technology, Boulder, CO, May, 1990
162. "Cs INDUCED ^{129}Xe NUCLEAR SPIN RELAXATION IN N_2 AND He BUFFER GASES," American Physical Society, Atlanta, GA, January, 1986

CONFERENCES: contributed talks and posters

American Physical Society March Meeting: 1986–97, 1999-2001, 2007-2008
International Semiconductor Device Research Symposium: 1995, 1997
SPIE Meeting: 1993
Materials Research Society Spring Meeting: 1992, 1996–98, 2001, 2003-2017
Materials Research Society Fall Meeting: 1994, 2000, 2002, 2004-2016
Gordon Research Conferences: 1990, 1991, 1992, 1996
American Vacuum Society Meeting: 1991
Electronic Materials Conference: 1996-2006, 2008
Microscopy Society of America: 1998
International Conference on Nitride Semiconductors: 2001
DOD Nanomaterials Workshop: 2005
210th Meeting of the Electrochemical Society: 2006
SPIE Optics + Photonics: 2007-2009
US-Korea Joint Symposium on Nanotechnologies: 2012
SPIE Photonic West: 2017
TMS: 2017