

## Deidra R. Hodges, Ph.D.

Department of Electrical and Computer Engineering  
The University of Texas at El Paso  
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### Professional Preparation

Dillard University	Physics	B.S.		1982
Columbia University	Electrical Engineering	B.S.		1983
Columbia University	Electrical Engineering	M.S.		1984
University of South Florida	Electrical Engineering	Ph.D.		2009

### Appointments

2020 - present	Assoc. Professor	Dept. of Electrical and Computer Engineering, UTEP
2014 - 2020	Asst. Professor	Dept. of Electrical and Computer Engineering, UTEP
2010 - 2014	Asst. Professor	Dept. of Electrical Engineering, SPSU (now KSU)
2014 - present	Visiting Faculty	NLSL II-CFN-Nonproliferation and National Security, BNL
1989 - 1993	Sr. Systems Engineer	Martin Marietta Manned Space Systems (Lockheed-Martin)
1984 - 1989	Software Engineer	IBM Federal Systems Division
1988 - 1996	Officer – Lt. JG	Engineering Field Division, U.S. Navy Reserves

### Products

#### ○ Journal Articles

1. Luis Valerio Frias, Angel De La Rosa, Victor Rodriguez, Christian Enriquez, Alberto Telles, Yves Ramirez, Daniel Rivera, Javier Herrero, Luis Bustamente, Xiao Tong and **Deidra Hodges**, “Characterization and Analysis of Device Fabrication Process for Performance Optimization of Perovskite Solar Cells”, *AIP Advances*, October, 2019.
2. Shaimum Shahriar, Venessa Castaneda, Manuel Martinez, Aditya Mishra, Tahmina Akter, Kelly Schutt, Jorge Boscoboinik and **Deidra Hodges**, “Oxidation States in perovskite layers formed using various deposition techniques”, *Journal of Renewable and Sustainable Energy*, October, 2019.
3. Felicia Manciu, Kevin Bennet, Yoonbae Oh, Abhijeet Barath, Aaron Rusheen, Abbas Kousani, **Deidra Hodges**, Jose Guerrero, Jonathan Tomshine, and Kendall Lee, “Analysis of Carbon-based Microelectrodes for Neurochemical Sensing”, *Materials*, October, 2019.
4. Castro-Colin, M., L. Banuelos, C. Diaz-Moreno, **Deidra Hodges**, E. Ramirez-Homs, D. Korolkov, N. Sharmin, and J. A. Lopez. "Temperature Effects in the Composition of Metal Halide Perovskite Thin Films", *Journal of Nuclear Physics, Materials Sciences, Radiation and Applications*, August 2018.
5. Rosales, C. A. G., Duarte, M. F. G., Kim, H., Chavez, L., **Hodges, Deidra**, Mandal, P., & Tseng, T. L. B. 3D printing of shape memory polymer (SMP)/carbon black (CB) nanocomposites with electro-responsive toughness enhancement. *Materials Research Express*, 2018.
6. L. O. Giraldo, A. Bolotnikov, G. Camarda, G. De Geronimo, J. Fried, **D. Hodges**, A. Hossain, E. Vernon, and R.B. James, "A linear array of position-sensitive virtual Frisch-grid CdZnTe for low-energy gamma rays." *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment*, 2018.

7. Luis O. Giraldo, Aleksey Bolotnikov, G. Camarda, G. De Geronimo, J. Fried, R. Gul, **D. Hodges**, A. Hossain, E. Vernon, and R.B. James, "Study of sub-pixel position resolution with time-correlated transient signals in 3D pixelated CdZnTe detectors with varying pixel sizes," *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment*, 2017.
  8. Luis Ocampo Giraldo, Aleksey E. Bolotnikov, G.S. Camarda, S. Cheng, G. De Geronimo, A. McGilloway, J. Fried, **D. Hodges**, A. Hossain, K. Ünlü, M. Petryk, Valerie Vidal, E. Vernon, G. Yang and R.B. James, Using a pulsed laser beam to investigate the feasibility of sub-pixel position resolution with time correlated transient signals in 3D pixelated CdZnTe detectors, *Nuclear Inst. and Methods in Physics Research, A*, 2017.
  9. Eva M. Deemer, P. K. Paul, Felicia S. Manciu, C. E. Botez, **Deidra R. Hodges**, Z. Landis, *et al.*, "Consequence of oxidation method on graphene oxide produced with different size graphite precursors," *Materials Science and Engineering: B*, vol. 224, pp. 150-157, 2017.
  10. Aditya Mishra, J. Catalan, D. Camacho, M. Martinez, and **Deidra Hodges**, "Evaluation of physics-based numerical modelling for diverse design architecture of perovskite solar cells," *Materials Research Express*, vol. 4, p. 085906, 2017.
  11. Aditya Mishra, **Deidra Hodges**, and R. Misra, "Influence of processing temperature and precursor composition on phase region of solution processed methylammonium lead iodide perovskite," *Materials Research Express*, vol. 4, p. 096201, 2017.
  12. Aditya Mishra, A. Kumar, **Deidra Hodges**, and R. Misra, "Tunable TiO<sub>2</sub>-pepsin thin film as a low-temperature electron transport layer for photoelectrochemical cells," *Materials technology*, vol. 32, pp. 829-837, 2017.
  13. Manuel Martinez, Shaimum Shahriar, Donato Kava, Cheik Sana, Vanessa Castañeda, Jose Galindo, **Deidra Hodges**, "Effects of Processing Parameters on Zinc Oxide Thin Films Prepared by Single Solution Deposition," *MRS Advances*, 2016
  14. Karim, H., Sarker, M. R. H., Shahriar, S., Shuvo, M. A. I., Delfin, D., **Hodges, D. R.**, Tseng, T.-L. B., Roberson, D. A., Love, N. D., Lin, Y, "Feasibility study of thermal energy harvesting using lead free pyroelectrics", *Smart Materials and Structures*, 25(5), 055022, 2016.
  15. Aleksey Bolotnikov, Kim Ackley, Giuseppe S. Camarda, Carly Cherches, Yonggang Cui, Gianluigi De Geronimo, Jack Fried, **Deidra Hodges**, Anwar Hossain, Wonho Lee, George Mahler, Maxwell Maritato, Matthew Petryk, Utpal Roy, Cynthia Salwen, Emerson Vernon, Ge Yang, and Ralph James, "An array of virtual Frisch-grid CdZnTe detectors and a front-end ASIC for large-area position-sensitive gamma-ray cameras", *Review of Scientific Instruments*, 2015.
- Conference Proceedings
1. **D. Hodges**, L. V. Frias, A. De La Rosa, A. I. Leyva, and X. Tong, *Synchrotron and optical probing of mixed lead halide perovskites for photovoltaics* vol. 11474: SPIE, 2020.
  2. **D. Hodges**, S. Shahriar, C. Camarillo, C. Maldonado, Y. Ramirez, V. Rodriguez, *et al.*, "Synchrotron and optical probing of hybrid organic-inorganic perovskite halides for photovoltaics," in *2019 IEEE 46th Photovoltaic Specialists Conference (PVSC)*, 2019, pp. 1170-1174.

3. C. Enriquez, **D. Hodges**, A. De La Rosa, L. V. Frias, Y. Ramirez, V. Rodriguez, *et al.*, "Perovskite Solar Cells," in *2019 IEEE 46th Photovoltaic Specialists Conference (PVSC)*, 2019, pp. 1157-1160.
3. Irakli Chakaberia; Mircea Cotlet; Merlin Fisher-Levine; **Diedra R. Hodges**; Jayke Nguyen; Andrei Nomerotski; "Time stamping of single optical photons with 10 ns resolution". *Proc. SPIE Advanced Photon Counting Techniques XI*, 102120Q, May 2017.
4. Nazia Sharmin, J. Lopez, **Deidra Hodges**, Shaimum Shahriar, Venassa Castaneda, and Aditya Kumar, "Degradation of perovskite samples over time," *Bulletin of the American Physical Society*, vol. 61, 2016.
5. Shaimum Shahriar, Cheik Sana, Jose Galindo, Donato Kava, **Deidra Hodges**, Edison Castro, Robert Cotta, David Buck, and Luis Echegoyen, "Characterization and Analysis of Structural and Optical Properties of Perovskite Thin Films" in *42<sup>th</sup> IEEE Photovoltaic Specialists Conference Proceedings*, New Orleans, LA, 2015.
6. Jose Galindo, Donato Kava, Shaimum Shahriar, Cheik Sana, Edison Castro, Robert Cotta, David Buck, and Luis Echegoyen and **Deidra Hodges**, "Low Cost Spin Coating Fabrication of Efficient Perovskite Thin Film Layers" in *42<sup>th</sup> IEEE Photovoltaic Specialists Conference Proceedings*, New Orleans, LA, 2015.
7. **Deidra Hodges**, Cheik Sana, Shaimum Shahriar, Jose Galindo, Donato Kava, Edison Castro, Robert Cotta, David Buck, and Luis Echegoyen "Earth Abundant and Nontoxic Material for Low Cost, Thin Film Solar Cells" in *2015 IEEE Conference on Technologies for Sustainability (SusTech)*, Ogden, Utah, 2015.
8. Okhio, Cyril, **Hodges, Deidra R.**, Black, Jennifer. (2010). Review of literature on nanofluid flow and heat transfer properties. *Cyber Journals: Multidisciplinary Journals in Science and Technology, Journal of Selected Areas in Nanotechnology (JSAN)*, 1, 1–8.
9. **Hodges, Deidra R.**, Jones, B., Moseley, T., Love, A., Burke, C., Jones, E., Tyx, I., Chaulogain, M., Johnson, O., "Development of CZTS Thin Films by Non-vacuum, Liquid-based Techniques for Efficient, Low-cost CZTS Solar Cells", in *39th IEEE Photovoltaic Specialists Conference Proceedings*, Tampa, FL, 2013.
10. **Hodges, Deidra R.**, Palekis, V., Bhandaru, S., Singh, K., Morel, D. L., Stefanakos, L., "Mechanical properties and adhesion of CdTe/CdS thin film solar cells deposited on flexible foil substrates". *MRS Proceedings*, 1165, 1165–M02, 2009.
11. Palekis, Vasellis, **Hodges, Deidra R.**, Morel, D. L., Stefanakos, L., Ferekides, C. S., "Structural Properties of CdTe Thin Films for Solar Cell Applications Deposited on Flexible Foil Substrates". *MRS Proceedings*, 1165, 1165–M08, 2009.
12. Palekis, Vasillis, Guntur, V., **Hodges, Deidra R.**, Morel, D., Stefanakos, E., Ferekides, C., "Substrate based CdTe solar cells fabricated on metallic foils: Device, material, and processing issues", in *Photovoltaic Specialists Conference (PVSC) 37th IEEE*, (pp. 002779–002783), 2011.
13. Palekis, Vasillis, Shen, Donna, **Hodges, Deidra R.**, Bhandaru, S., Stefanakos, E., Morel, D., Ferekides, C., "Structural properties of CdTe and ZnTe thin films deposited on flexible foil substrates", *Photovoltaic Specialists Conference (PVSC) 35th IEEE*, (pp. 001960–001963), 2010.
14. Shen, Dona, Palekis, V., **Hodges, Deidra R.**, Bhandaru, S., Guntur, V., Stefanakos, E., Morel, D., Ferekides, C., "Tellurides as back contacts for substrate CdTe thin film solar

cells on flexible foil substrates”, *Photovoltaic Specialists Conference (PVSC) 35th IEEE*, (pp. 001973–001976), 2010.

15. **Hodges, Deidra R.**, Palekis, Vasillis, Shen, Dona, Singh, K., Bhandaru, S., Stefanakos, E., Morel, D., Ferekides, C., “Development of back contacts for CdTe thin film solar cells deposited on flexible foil substrates”. (pp. 001649–001653), 2009.
  16. Zhao Hehong, T. M. Razykov, **Deidra Hodges**, A. Farah, C. S. Ferekides, and D. Morel, "Introduction of Sb in CDTE and its effect on CDTE solar cells," in *Photovoltaic Specialists Conference, PVSC '08. 33rd IEEE*, 2008, pp. 1-5.
- Invited Presentations
1. SPIE Organic, Hybrid, and Perovskite Photovoltaics XXI Conference, San Diego, CA, August 23-27, 2020.
  2. BNL CFN, Upton, NY, “Perovskite Photovoltaics and Gamma-ray Radiation Detectors Research Highlights”, 2014-2019.
  3. miniCAST Night at the Museum Lightning Talks\_Energy Sustainability and Photovoltaics October 19, 2018.
  4. SUNY Canton, *Women in Engineering*,\_May 16, 2018.
  5. WIN, Thin Film Photovoltaics, Renewable Energy & Sustainability\_April 5, 2018.
  6. Florida International University Fall 2017 Seminar Series\_Perovskite PV, X-ray and Gamma-ray Detectors\_November 17, 2017.
  7. USF College of Engineering and NREC Seminar\_Perovskite PV, X-ray and Gamma-ray Detectors\_October 31, 2017.
  6. AVS 64<sup>th</sup> International Symposium, Tampa, FL, “Synchrotron-Based X-ray Spectroscopy Studies of Inorganic-Organic Hybrid Perovskite Materials Surfaces and Properties”, 2017.
  7. DOE/ NREL HOPE, Golden, CO, “Understanding the power of PV and how our research will be used”, 2014, 2016, 2019.
  8. BNL Visiting Faculty Program (VFP), Upton, NY, “Perovskite PV, X- and  $\gamma$ -ray Detectors”, 2014-2019.
  9. IEEE Technologies for Sustainability, Ogden, Utah, “Earth Abundant and Nontoxic Material for Low Cost, Thin Film Solar Cells”, 2015.
  10. AVS 62<sup>nd</sup> International Symposium, San Jose, CA, “Spin Coating Thin Film CZTS for Efficient, Low-Cost Solar Cells on Flexible Glass Substrates”, 2015.
- Contributed Presentations
1. **Deidra Hodges**, Shaimum Shahriar, Clara Camarillo, Carlos Maldonado, Yves Ramirez, Victor Rodriguez, Tahmina Akter, Geoffrey Saupe, Garth Williams, Juergen Thieme, Fernando Camino, Mingxing Li, Mircea Cotlet, Nusnin Akter, J. Anibal Boscoboinik, Luis Ocampo, and Aleksey Bolotnikov, “Synchrotron-Based X-ray Spectroscopy Studies of Inorganic-Organic Hybrid Perovskite Materials Surfaces and Properties”, in *46<sup>th</sup> IEEE Photovoltaic Specialists Conference Proceedings*, in Chicago, IL, 2019. **Nominated for Best Poster award.**

2. **Deidra Hodges**, Kelly Schutt, Bernard Wenger, Shaimum Shahriar, Clara Camarillo, Carlos Maldonado, Yves Ramirez, Victor Rodriguez, Tahmina Akter, Geoffrey Saupe, Garth Williams, Juergen Thieme, Fernando Camino, Mingxing Li, Mircea Cotlet, Nusnin Akter, J. Anibal Boscoboinik, Luis Ocampo, Aleksey Bolotnikov and Henry J. Snaith, "Synchrotron-Based X-ray Spectroscopy Studies of Inorganic-Organic Hybrid Perovskite Materials Surfaces and Properties", *11<sup>th</sup> International Conference on Inelastic X-ray Scattering (IXS2019)*, Stony Brook University, NY, 2019.
3. Angel De La Rosa, "Fabrication of Single Perovskite Solar Cells and Projection to Increase  $V_{oc}$  via  $SnO_2$  Experimentation", *11<sup>th</sup> International Conference on Inelastic X-ray Scattering (IXS2019)*, Stony Brook University, NY, 2019
4. Luis Valerio, "Analysis of Device Fabrication's Process for Optimization of Perovskite Solar Cells", *11<sup>th</sup> International Conference on Inelastic X-ray Scattering (IXS2019)*, Stony Brook University, NY, 2019
5. RICE University: Materials Today: Materials Science for the Next Two Decades Synchrotron and Optical Probing of Hybrid Organic-Inorganic Perovskite Halides for Photovoltaics, September 27, 2018.
6. **Deidra Hodges**, Shaimum Shahriar, Venassa Castaneda, Aditya Kumar, Valarie Vidal, Manuel Martinez, Nazia Garcia, Jazmin Munoz, and Jenny Lopez, "Synchrotron-Based X-ray Spectroscopy Studies of Inorganic-Organic Hybrid Perovskite Materials Surfaces and Properties", *AVS 64<sup>th</sup> International Symposium*, Tampa, FL 2017.
7. Jose Galindo, Chiek Sana, Shaimum Shahriar, Donato Kava, Manuel Martinez, Vanessa Castañeda, **Deidra Hodges**, "Room Temperature Processed CuSCN Hole Transportation Layers for the Use in Perovskite Based Solar Cells," *MRS Spring Meeting*, Phoenix, Arizona, 2016.
8. MRS 2016 Spring Meeting, Phoenix, AZ, 2016.
9. 42<sup>nd</sup> IEEE Photovoltaics Specialists Conference, New Orleans, LA, 2015.

## RESEARCH IN PROGRESS

### o Funded Research

1. Hodges, Deidra R (PI), "Synchrotron and Optical Probing of Hybrid Organic-Inorganic Perovskite Halides for All-Perovskite Triple Junction (a-P3J) Tandem Photovoltaics", Sponsored by the **Sloan Foundation, \$10,000**, Aug. 1, 2019 – May 31, 2020.
2. Hodges, Deidra R (Co-PI), Ramana, Chintalapalle (PI), "Acquisition of an Atomic Layer Deposition System to Realize Advanced High Electrical Strength Materials for Extreme Environment Applications," **\$590,000**. Sponsored by **ARO**, (June 21, 2019 - Present). Equipment grant.
3. Hodges, Deidra R (Co-PI), "Investigation and Study of Hybrid Perovskite Halides for X- and Gamma-ray Detectors and Photovoltaics" Sponsored by **Dept. of Education, \$49,954**. (June 1, 2019 - August 30, 2019), Supplement through Dept. of Education MSEIP, Villa, Elsa (PI).
4. Hodges, Deidra R (Co-PI), "Hybrid Inorganic-Organic Perovskite Halides Thin-Film Photovoltaics Co-PI," Sponsored by **NSF, \$63,307**, (May 1, 2018 - August 30, 2018), Supplement through NSF LSAMP, Flores, Benjamin C (PI).
5. Hodges, Deidra R (Co-PI), "Hybrid Inorganic-Organic Perovskite Halides Thin-Film Photovoltaics," Sponsored by **NSF, \$52,755**. (May 1, 2017 - August 30, 2017), Supplement through NSF LSAMP, Flores, Benjamin C (PI).

6. Hodges, Deidra R (PI), "Investigation of Hybrid Inorganic-Organic Perovskite Halides: Materials Structure and Property Relationships for Photovoltaics," **\$5,000**. Sponsored by **UTEP URI** (February 1, 2019 - August 30, 2019).
  7. Hodges, Deidra R (Key Personnel), Misra, Devesh (PI), "Acquisition of an Advanced Thermal Analysis and Imaging System for Integration with Interdisciplinary Research and Education in Low Density Organic-Inorganic Materials," Sponsored by **ARO**, **\$494,532**. (June 27, 2016 - Present), Equipment grant.
  8. Hodges, Deidra R (Key Personnel), Lopez, Jorge A (PI), "Surface Characterization of Materials," Sponsored by **ARO**, **\$404,514**. (June 1, 2016 - Present), Equipment grant.
  9. Hodges, Deidra R (Co-PI), "An Integrated Mechanical, Testing and Characterization System for Thin-Engineered Materials Subjected to Ultra-High-Cycled Fatigue," **UTEP Research Initiative**, **\$20,000**. (August 30, 2016), Stewart, Calvin (PI).
  10. Hodges, Deidra R (Co-PI), "Hybrid Inorganic-Organic Perovskite Halides Thin-Film Photovoltaics," Sponsored by **NSF**, **\$46,268**. (May 1, 2016 - August 30, 2016), Supplement through NSF LSAMP, Flores, Benjamin C (PI).
  11. Hodges, Deidra R (PI), "Investigation of Hybrid Inorganic-Organic Perovskite Halides: Materials Structure and Property Relationships for Photovoltaics," **\$5,000**. Sponsored by **UTEP URI** (November 1, 2015 - August 30, 2016).
  12. Hodges, Deidra R (PI), "MRI: Acquisition of a Thin-Film Materials Deposition System," Sponsored by **NSF**, Federal, **\$204,150**. (September 1, 2012 - August 31, 2013).
  13. Hodges, Deidra R (PI), "CZTS Thin-Films and Solar Cells by Liquid-Based Techniques," Sponsored by **NSF**, Federal, **\$175,000**. (August 15, 2011 - July 31, 2013).
- o Other Research – The following peer-reviewed proposals were approved by BNL Center for Functional Nanomaterials (CFN), a user-oriented nanoscience research facility. No cost access was provided to specified instruments, facilities, techniques and Scientists in support of the PI's perovskite thin-film photovoltaics research. Additionally, most recently, no cost access was provided to the National Synchrotron Light Source (NSLS II) in support of the PI's research.
1. Hodges, Deidra R (PI), "Nanoscale Advanced X-ray and Optical Probing, Spectroscopy, Microscopy and the Nanoscience of Hybrid Inorganic-Organic Perovskites Halides for Thin Film Photovoltaics," BNL Center for Functional Nanomaterials (CFN). (May 1, 2019 - December 2020).
  2. Hodges, Deidra R (PI), "Nanoscale Advanced X-ray and Optical Probing, Spectroscopy, Microscopy and the Nanoscience of Hybrid Inorganic-Organic Perovskites Halides for Thin Film Photovoltaics," BNL Center for Functional Nanomaterials (CFN). (January 1, 2017 - April 30, 2018).
  3. Hodges, Deidra R (PI), "Advanced Optical and Spectroscopy and Microscopy Probing and the Nanoscience of Hybrid Inorganic-Organic Perovskites Halides for Thin Film Photovoltaics," BNL Center for Functional Nanomaterials (CFN). (July 1, 2016 - August 30, 2016).
  4. Hodges, Deidra R (PI), "Nanoscale Advanced X-ray Probing and Spectroscopy and the Nanoscience of Hybrid Inorganic-Organic Perovskites Halides for Thin Film Photovoltaics," BNL Center for Functional Nanomaterials (CFN). (July 1, 2016 - August 30, 2016).

## TEACHING ACCOMPLISHMENTS

- New (3) and Existing (2) Courses Developed:

1. **EE3325 - Applied Quantum Mechanics for EE**

An introductory course designed to provide students with a fundamental understanding of (1) electron energy, electron/photon interaction, and electron energy transitions; (2) electromagnetic wave theory and quantization of photon energy; (3) laser theory and operation; and (4) advanced applications such as quantum dots, zener diodes and resonant tunneling diodes. This includes applying boundary conditions to solve the time-independent Schrödinger's equation, normalization of the wave function, and applying fundamental solutions such as the infinite potential well (particle-in-a-box) and finite potential well to laser, quantum dot and tunneling applications.

2. **EE4377/EE5381 - Applied Photovoltaics**

Semiconductors have emerged as the most promising class of materials that can convert sunlight directly into electrical energy. This course presents the fundamental principles of the solar energy conversion process and the most common cell technologies are discussed. A range of semiconductor materials are discussed for their potential use in photovoltaic applications, considering the material properties that affect the device performance, including efficiency, cost and environmental conditions (e.g., terrestrial or space applications and duration of sunshine), and the availability and toxicity of the raw materials. This course will also cover a range of fundamental problems and the relationship between the physics, material science, and technology aspects of solar cell development. Students will learn the fundamental and quantitative principles of the solar energy, as well as its potential economic and societal impact.

3. **EE4395/EE5380 - Renewable Energy and Energy Sustainability**

Energy is a major key to industrial development and a worldwide economy. Constantly growing demand for energy that relies on a finite supply of fossil fuels, presents challenges for scientists, engineers and governments to explore and develop alternative sources of energy that are continuous, renewable and environmentally friendly. This course provides important knowledge about many aspects of renewable energy sources. This course assesses the current and potential future energy systems, covers resources, extraction, conversion, and end-use, and emphasizes meeting regional and global energy in the 21<sup>st</sup> century in a sustainable manner. Students will learn the fundamental and quantitative principles of the renewable energy options, as well as their potential economic and societal impact.

4. **EE4395/EE5390 - Semiconductor Material and Device Characterization**

Semiconductor material and device characterization has continued to advance with the development of new techniques and the improvements in existing techniques. This course presents the fundamental principles of many of the characterization techniques used in the semiconductor industry. Concepts and theory underlying the techniques are reviewed, and

selected experimental results are presented. Emphasis is on techniques employing electrical, optical and physical/chemical characterization, including scanning probe techniques: X-ray fluorescence, contactless lifetime/diffusion length measurements, and charged-based techniques including transmission electron microscopy through the use of focused ion beam sample preparation.

**5. EE4350/EE5390 - Device Electronics for Integrated Circuits**

The impact of integrated circuits (ICs) and semiconductor devices on engineering and on the broader society continues to grow. ICs contain tens-of-millions of active devices on a chip. The majority of chips are formed of silicon and the majority of devices are metal-oxide-semiconductor (MOS) field-effect transistors (MOSFETS), which displaced the formerly dominant bipolar junction transistors (BJTs). This course provides an overview of the physical electronics of semiconductors, silicon technology, IC fabrication, *pn* junctions, bipolar transistors, and MOSFETS.

- Teaching Evaluations

Below is the summary of teaching evaluations listing the overall instructor and course evaluations.

- Instructor overall evaluation: range 4.7 to 5.0; **average 4.94**
- Course overall evaluation: range 4.5 to 5.0; **average 4.81**

Semester	Course	Enrl	Resp	Instr Ovr	CrseOvr
Spring 2019	EE3325	70	44	Av.6/1/2019	6/1
	EE4377	31	21	Av.6/1/2019	6/1
	EE5381	11	11	Av.6/1/2019	6/1
Fall 2018	EE3325	66	18	5	5
	EE4395	25	10	5	4.909
	EE5380	5	1	5	4.909
Spring 2018	EE3325	66	18	5	4.888
	EE4350	29	9	4.9166	4.75
	EE5390	6	3	4.9166	4.75
Fall 2017	EE3325	63	10	5	4.7
	EE4395	21	4	5	5
	EE5380	8	3	5	5
Spring 2017	EE3325	42	10	4.8	4.5
	EE4395	23	8	5	5
	EE5390	9	3	5	5
Fall 2016	EE3325	63	14	4.7857	4.5714
	EE5380	16	14	4.9285	4.7142
	EE4395	28	14	4.9285	4.7142
Spring 2016	EE3325	50	17	4.7058	4.6470
	EE5390	12	12	5.0000	5.0000
	EE4395	18	12	5.0000	5.0000



Fall 2015	EE3325	49	20	4.9500	4.5500
	EE5390	11	7	4.8571	4.4285
	EE4395	17	7	4.8571	4.4285
Spring 2015	EE5390	9	7	5.0000	5.0000
	EE4395	19	7	5.0000	5.0000
Fall 2014	EE3325	41	27	4.9629	4.8518

Comment #1: Spring 2018 EE3325

The content is easy to follow along, and it was found beneficial to do the in-class examples as a class. I felt that this class further stimulated my interest in electrical engineering. \*\*\* Excellent instructor, knows what she is talking about and likes it. It looks like she likes to teach and challenge students. She cares for her students but is strict at the same time. You can see that she enjoys when the students question what she is teaching. Meaning that she makes the students to be more involved in the class. \*\*\* Amazing professor and teaching methods were great. \*\*\* Loved this course and the professor!

Comment #2: Fall 2017 EE3325

The class was very interesting and engaging. The professor kept us engaged with the content and always had new ways of teaching us about the material. \*\*\* I absolutely loved Dr. Hodges class. I went to every single class waking up at 6:30am every day happy to go to class because she was such an awesome lecturer and made class fun every single class.

- Honors and Awards in Teaching
  - UTEP Electrical and Computer Engineering Class of 2019 Nicest Professor Award.
  - UTEP College of Engineering Dean's Award for Excellence in Teaching, 2017.
  - UTEP Electrical and Computer Engineering Class of 2016 Best Professor Award.
  - SPSU Teacher of the Year Award, 2012.

## SERVICE AND HONORS

- Professional Honors, Prizes, Fellowships
  - 46<sup>th</sup> IEEE PVSC June 16-21, 2019, Chicago, IL. **Nominated for best poster.**
  - Department – Faculty Marshall of Students for the College of Engineering, May 2017
  - Department – Administered the Oath at the Assembly of the Engineers, 2015-2018.
  - USF Presidential Leadership Award.
  - Alfred P. SLOAN and F.E.F. McKnight Doctoral Fellowships Awards.
  - Martin Marietta Manned Space Systems Thomas Jefferson Cup Award and Independent Research and Development of the Year Award.
- UTEP Committees Served
  - University – Search committee member for the New Athletic Director
  - College – Tau Beta Pi Engineering Honor Society, Faculty Advisor, 9/2015-present.
  - Department (MMBM) – Search committee member, (8/16/2019-present)
  - Department – Alternate to the Faculty Senate, (9/2019 – present)
  - Department – Library Faculty Departmental Liaison, (9/1/2017-present)
  - Department – Energy, Electromagnetic Fields, and Devices (EFD), (9/1/2014-present)

- Membership in Professional Societies
  - Professional Memberships: Institute of Electrical and Electronics Engineer (IEEE), Institute of Nuclear Materials Management (INMM), Electron Device Society (EDS), Materials Research Society (MRS) and American Society for Engineering Education (ASEE).
- Other Professional Activities and Public Service
  1. **Editor** - Editor of Elsevier's *Materials Science in Semiconducting Processing (MSSP)*. <https://www.journals.elsevier.com/materials-science-in-semiconductor-processing/editorial-board/assist-prof-deidra-r-hodges-phd>
  2. **Harvard University** – 2019 Minority Faculty Development Workshop, *Engineering a World of Difference: Policy and Practice*, Sept. 18-21, 2019. **Invited participant.**
  3. **Dept. of Education, Washington, DC** – MSEIP CCEM Capacity Building Grant Conference, Oct. 27-29, 2019. **Invited speaker** (did not speak due to insufficient time).
  4. **National Renewable Energy Laboratory (NREL)** Hands-on Photovoltaic Experience (HOPE) and Faculty Development Workshops, July 2019, July 2016 and June 2014. **Invited talks and panelist.**
  5. **National Science Foundation (NSF) ECCS** – July 7-9, 2019. **Invited Panelist.**
  6. **Brookhaven National Laboratory (BNL) Center for Functional Nanomaterials (CFN)** – **Proposal reviewer.** July 5-7, 2019.
  7. **EXAFS 2018 Short Course: Intro to X-ray Absorption Spectroscopy**, BNL, November 6-8, 2019. **Selected attendee.**
  8. BNL Center for Functional Nanomaterials (CFN) **Ambassador**, (8/1/2018 – present)
  9. Southern New Mexico Dust Conference with Department of Geological Sciences, Las Cruces, NM, April 17, 2019. **Attendee.**
  10. 2018 NSF EFRI Workshop: Convergence and Interdisciplinarity in Advancing Larger Scale Research, May, 14, 2018. **Attendee.**
  11. Dept. of Energy Consolidated Nuclear Research Reviewer, NSF Panelist Reviewer, and Journal Referee for Thin Solid Films Journal, SPIE Optical Engineering and Journal of Applied NanoScience. **Reviewer.**
  12. Conference Session Chairs for the 5<sup>th</sup> Southwest Energy Science and Engineering Symposium, and the College of Engineering Research Forum. **Session Chair.**
  13. College of Engineering Tau Beta Pi (TBP) FACULTY Advisor; hosted a district conference 5/2017 at UTEP. Chapter recipient of an endowment from the National TBP organization.
  14. UTEP Order of the Engineer Ceremony – administration of the Obligation speaker.
  15. Participated in a Whitehouse STEM seminar at Tuskegee, at the request of NREL, with plans to develop URM in STEM at NREL collaboration.
  16. UTEP collaborations with faculty in Mechanical Engineering (Calvin Stewart, Yirong Lin, Pavana Prabhakar), Physics (Felicia Manciu and Jorge Lopez), and Metallurgy (Binata

Joddar and Devesh Misra), and external collaborations with BNL (Radiation Detection, NSLS II, and CFN), and NREL Hands-on Photovoltaics and Faculty Development.

17. Worked with the PREM supporting 6 students (1 GR, 4 UG and 1 UCSB). Attended a PREM meeting at NSF in Washington, DC and attended a PREM conference at UCSB.
18. Attended professional development workshops: 1) NREL, 2) WoC conference at Stanford University and NSF's MFDW in Washington, DC.
19. Invited to use the BNL National Synchrotron Light Source II Beamline 5-ID Submicron Resolution X-ray Spectroscopy (SRX). Performed both XANES and XRF synchrotron radiation analysis of perovskite and cadmium zinc telluride materials for solar cells and radiation detectors.
20. Traveled to Carnegie Mellon University with former Interim Dean Ferregut and a group of College of Engineering faculty, to identify and develop collaborative opportunities with CMU faculty.