TEXAS STATE VITA

I. Academic/Professional Background

A. Name and Title

Name: Dr. Mark A. Wistey Title: Associate Professor

B. Educational Background

Degree	*Year*	*University*	*Major*	*Thesis/Dissertation*
PHD	2005	Stanford University	Electrical Engineering	
MS	2000	Stanford University	Electrical Engineering	
BS	1994	Montana State University	Electrical Engineering	

C. University Experience

Position	*University*	*Comments*	*Dates*
Associate Professor, Physics Department	Texas State University. San Marcos, TX, United States	Research component: Growth and fabrication of cutting edge optoelectronic and electronic materials and devices, particularly for silicon photonics and solar cells.	July 1, 2017 - Present
Assistant Professor	University of Notre Dame. Notre Dame, IN, United States		July 1, 2009 - June 30, 2017
New Faculty Teaching Workshop, Teaching Well By Design, Kaneb Center for Teaching and Learning	University of Notre Dame		2009 - 2010
Postdoctoral Scholar	University of California Santa Barbara. Santa Barbara, CA, United States	Joint appointment with Art Gossard in Materials Science and Mark Rodwell in Electrical and Computer Engineering, doing growth and supervising fabrication of cutting	2007 - 2009

Position	*University*	*Comments*	*Dates*
		edge transistors and related devices and materials.	
Co-Instructor, Materials Science Department	UC Santa Barbara. Santa Barbara, United States	Co-taught the Molecular Beam Epitaxy and Heterostructure Devices course.	2007
Postdoctoral Research Associate	Arizona State University. Tempe, AZ, United States	Electronic device fabrication and semiconductor materials growth. Supervised growth of the highest quality thin germanium ever grown on silicon substrates.	2006
Visiting Scholar	Stanford University	Achieved new record wavelengths in the infrared for GaAs-based, surface-emitting lasers for telecommunications and data communication between chips.	2005
Graduate Research Assistant	Stanford University		1999 - 2004
Visiting Researcher	Lawrence Livermore National Laboratory. Livermore, CA, United States	Characterized lasers grown by myself and fellow students using facilities at LLNL.	2000 - 2001
Teaching assistant	Stanford University	4 courses in engineering and semiconductor physics. Stanford's EE department normally reserves TA positions for students who had also attended Stanford as undergrads (and thus taken the courses themselves), but they made an exception	1991 - 2001

Position	*University*	*Comments*	*Dates*
		for me based on my dedication and aptitude for teaching.	
Macintosh Forensics Course Development	CinnabarMac. Livingston, MT, United States	Co-developed a professional, multiple-day course on Macintosh forensics for law enforcement.	1996 - 1997
Texts and Critics Oxford tutorial (junior fellow)	Montana State University Honors Program. Bozeman, MT, United States	Co-led one of the Honors Program's flagship Oxford-style, full-semester tutorials.	1993
Campus lead organizer for College Bowl, College Bowl	Montana State University		1991

D. Relevant Professional Experience

Position	*Entity*	*Comments*	*Dates*
Development Engineer	CinnabarMac, Livingston, MT, United States	Designed, built, and prototyped a microcontroller-based interface kit that could replace the unreliable trackballs in early PowerBook laptops with trackpads several years before Apple started using them.	1995 - 1997
Science and Engineering Research Semester	Lawrence Livermore National Laboratory		1993
First Aid, Advanced First Aid, and CPR Instructor	American Red Cross, Bozeman, MT, United States	Additional teaching experience: Certified Red Cross instructor in Advanced First Aid and lower tier courses. Taught several in Bozeman, MT area for Red Cross and/or MSU.	1990 - 1993
Instructor for advanced and standard first aid, CPR, and swimming	American Red Cross and Livingston	Early, formative teaching experience as swimming	1988 - 1992

Position	*Entity*	*Comments*	*Dates*
	(Montana) City Pool, Livingston, MT, United States	instructor and lifeguard.	
Dorm president	Quad D, Montana State University		1990 - 1991
Software Engineering	Video Lottery Consultants (now IGT), Bozeman, MT, United States	Designed and created a test suite that could simulate thousands of gaming terminals in real time, for stress testing the company's automated audit system deployed across several states.	1990 - 1991
Assembly language programming	Park High School, Livingston, MT, United States	Early experience in teaching: Taught 6502 assembly language to the school's Advanced Computer Science course.	1989

II. TEACHING

A. Teaching Honors and Awards:

Award / Honor Recipient: Presidential Distinction for Excellence in Teaching, College of Science and Engineering.
August 2022

Award / Honor Recipient: Alumni Association Teaching Award of Honor, Alumni Association.
2020

Award / Honor Recipient: Outstanding Teacher Award, Department of Electrical Engineering.
2013

Additional Comments: Notre Dame

Award / Honor Recipient: UCSB Materials Research Lab ScienceLine Award for K-12 Outreach.
2009

2008

Award / Honor Recipient: Rocky Mountain Science Symposium, and Montana Council of Teachers of Mathematics contests, AHSME.
1988 - 1989

B. Courses Taught:

Texas State University:

MSEC 7103 - RESEARCH MSEC

MSEC 7199 - DISSERTATION

MSEC 7203 - RESEARCH MSEC

MSEC 7299 - DISSERTATION

MSEC 7303 - RESEARCH MSEC

MSEC 7310 - NANO SYST & DEV

MSEC 7399 - DISSERTATION

MSEC 7699 - DISSERTATION

MSEC 7999 - DISSERTATION

PHYS 2435 - WAVES & HEAT

PHYS 3416 - APPL ELECTRONICS

PHYS 4121 - UG RESEARCH

PHYS 4221 - UG RESEARCH

PHYS 4321 - UNDERGRAD RESEARCH

PHYS 5199B - THESIS

PHYS 5324 - THIN FILM SYNTH CHAR LAB

PHYS 5395 - FUND OF RESEAR

PHYS 5399A - THESIS

PHYS 5399B - THESIS

University of California Santa Barbara:

Materials 217 - Molecular Beam Epitaxy and Band Gap Engineering

Materials 288P - Alternative Energy Materials and Devices

University of Notre Dame:

EE 30347 - Semiconductors I

EE 40447 - Alternative Energy Devices and Materials

EE 47010 - Alternative Energy Devices and Materials

EE 60556 - Solid State Devices

C. Directed Student Learning (i.e. theses, dissertations, exit committees, etc.):

Supervisor / Chair, Dissertation, "(TBD -- Qian Meng, Computational Modeling of BGaAs Alloys)", Status: In Progress. (April 4, 2019 - Present). Physics, University of Texas at Austin.
Student(s): Qian Meng, Doctoral, Ph.D.

Additional Comments: I am this student's primary Ph.D. advisor in the subject matter of her thesis, though she is a member of Seth Bank's research group in Electrical and Computer Engineering at the University of Texas at Austin.

Supervisor / Chair, Dissertation, "Growth and Characterization of Germanium Tin Carbide Alloys: Possible Photonic Materials for Lasers and Amplifiers (Tuhin Dey)", Status: Completed. (July 1, 2017 - June 21, 2023). Materials Science, Engineering, and Commercialization (MSEC) Program, Texas State University.
Student(s): Tuhin Dey, Doctoral, Ph.D.
PhD Dissertation_Tuhin Dey_final-1.pdf
PhD_Dissertation_Tuhin Dey5-1.pptx

Supervisor / Chair, Master's Thesis, "Molecular Beam Epitaxy Growth and Characterization of Germanium Tin Carbide Multiple Quantum Well Structures (Augustus Arbogast)", Status: Completed. (July 1, 2019 - December 31, 2022). Physics, Texas State University.
Student(s): Augustus Arbogast, Graduate, MS.
Augustus Arbogast Final Thesis V3-1.pdf
Thesis PowerPoint Presentation V5-1.pdf

Member, Master's Thesis, "Ab Initio Computational Modeling of Surface Supercells of Pseudo-Cubic Halide Perovskites (Leo Rodriguez)", Status: Completed. (June 30, 2021 - December 13, 2022). Physics, Texas State University.
Student(s): Leobardo Rodriguez, Graduate, M.S.
Final defense slides-MAPbX_Data_v8.1-1.pptx
Additional Comments: Defended in late 2022, degree will be conferred in 2023.

Member, Dissertation, "PRINTED AND FLEXIBLE MICRO-ELECTRO-MECHANICAL-SYSTEM (MEMS) SWITCH FOR HIGH-FREQUENCY APPLICATIONS (Mahmuda Monne)", Status: Completed. (August 20, 2019 - December 31, 2021). Materials Science, Engineering, and Commercialization (MSEC), Texas State University.
Student(s): Mahmuda Monne, Doctoral, Ph.D.

Additional Comments: Student: Mahmuda Akter Monne.
Dates represent when I became active on Ph.D. committee, not student's activity dates.

Supervisor / Chair, Dissertation, "DIRECT BANDGAP GERMANIUM FOR ACTIVE SILICON PHOTONICS APPLICATIONS", Status: Completed. (May 15, 2018 - December 17, 2021). Materials Science, Engineering, and Commercialization (MSEC), Texas State University.
Student(s): Md. Shamim Reza, Doctoral, Ph.D.
REZA-DISSERTATION-2022-1.pdf
Shamim Reza_Dissertation_Presentation-1.pptx
Additional Comments: Student: Md. Shamim Reza

Member, Dissertation, "Band gap engineering studies of PbTe, SnTe, and CdSeTe for CdTe solar cell applications (Elizabeth G. LeBlanc)", Status: Completed. (February 14, 2018 - July 15, 2020). Materials Science, Engineering, and Commercialization (MSEC), Texas State University.
Student(s): Elizabeth LeBlanc, Doctoral, Ph.D.

Additional Comments: Student: Elizabeth G. LeBlanc

Supervisor / Chair, Master's Thesis, "SEMICONDUCTOR MATERIAL AND DEVICE SIMULATIONS INVOLVING HIGHLY MISMATCHED ALLOYS (Istvan Gulyas)", Status: Completed. (July 1, 2017 - June 30, 2019). Physics, Texas State University.
Student(s): Istvan Gulyas, Graduate, M.S.
GULYAS-THESIS-2019 Approved-1.pdf

Member, Dissertation, "Efforts to Improve p-Type Doping and Back Contact of Single and Polycrystalline CdTe Solar Cell (Sadia Rab)", Status: Completed. (February 14, 2018 - June 6, 2019). Materials Science, Engineering, and Commercialization (MSEC), Texas State University.
Student(s): Mahmuda Monne, Graduate, Ph.D.

Member, Master's Thesis, "COPPER IODIDE AND COPPER (I) OXIDE BASED HOLE TRANSPORT MATERIALS FOR METHYLAMMONIUM LEAD IODIDE PHOTOVOLTAIC DEVICE OPTIMIZATION (Kevin Lyon)", Status: Completed. (November 29, 2018 - April 30, 2019). Physics, Texas State University.
Student(s): Kevin Lyon.

Additional Comments: Student: Kevin Lyon

Student Dalim Mia transferred to another research group., Dissertation, "(Dalim Mia -- transferred to another group)", Status: Completed. (July 1, 2017 - July 31, 2018). Materials Science, Engineering, and Commercialization, Texas State University.
Student(s): Dalim Mia, Doctoral, Ph.D.

Additional Comments: Student Dalim Mia transferred to another research group.

Supervisor / Chair, Dissertation, "TOWARD DIRECT BANDGAP GERMANIUM OPTOELECTRONICS", Status: Completed. (April 2016). Electrical Engineering, University of Notre Dame.
Student(s): William O'Brien, Doctoral, Ph.D.

Supervisor / Chair, Dissertation, "GROWTH AND SIMULATION OF DIRECT BANDGAP GERMANIUM ALLOYS", Status: Completed. (April 2015). Electrical Engineering, University of Notre Dame.
Student(s): Chad Stephenson, Doctoral, Ph.D.

D. Courses Prepared and Curriculum Development:

EE 60566 Solid State Devices, Curriculum Development, University of Notre Dame. Taught: 2010 - 2017.

Additional Comments: Revised course with new material, new textbook.
Dates (enrollment / composite evaluation out of 5.0):
Spring 2010 (16/4.3), Spring 2011 (11/4.1), Spring 2012 (16/4.6), Spring 2014 (14/4.4), Spring 2015 (11/4.8), Spring 2016 (13/4.2), Spring 2017 (11/4.6).

EE 30347 Semiconductors I, Curriculum Development, University of Notre Dame. Taught: August 2011 - December 2015.

Additional Comments: Revised course with new material, new teaching approach.
Dates (enrollment / composite evaluation out of 5.0):
Fall 2011 (30/3.9), Fall 2013 (37/4.4), Fall 2015 (34/4.7).

Molecular Beam Epitaxy, First Time Course Preparation, Texas State University. Proposed: July 2017 - August 2017.

Additional Comments: Partial series of lectures for possible future course in Epitaxy and Heterogeneous Integrated Devices.

Alternative Energy Materials and Devices, New Course, UC Santa Barbara. Taught: 2007.

Additional Comments: New course taught in Materials Department, co-taught with fellow postdoc Mike Scarpulla.

Alternative Energy Devices and Materials, New Course, University of Notre Dame. Taught: August 2009 - December 2016.

Additional Comments: EE 40447/60647, formerly 47010/67034.
Dates (enrollment / composite evaluation out of 5.0):
New course, Fall 2009 (19/4.6). Also: Fall 2010 (22/3.6), Fall 2012 (27/4.4), Fall 2014 (24/4.4), Fall 2016 (36/4.4). More than half new material added to my similarly-titled course at UC Santa Barbara.

EE 67051 Optoelectronics, New Course, University of Notre Dame. Taught: 2013.

Additional Comments: Mentored and assisted/supervised a new graduate course, co-taught by one of the Ph.D. students in my research group.

Applied Electronics, Revise Existing Course, Texas State University. Taught: August 2020 - December 2020.

Additional Comments: For this semester, I replaced the curriculum in Applied Electronics (PHYS 3416) using a different textbook, implementing a hands-on, "mini project"-based weekly curriculum and labs. This change was in addition to a major project at the end of the course. The revision provided tremendous freedom for students to perform flexible lab experiments at home during the outbreak, which was crucial to maintain student immersion in the course material. Previously, students were tied to a costly, rigid workstation in the laboratory. I also coordinated kits of electronic circuit parts to be distributed to every student, with help from department support staff (Juan Ortega).

Waves and Heat (PHYS 2435), Revise Existing Course, Texas State University. Taught: March 2020 - May 2020.

Additional Comments: When the COVID outbreak struck, I worked with my TAs to replace all of the remaining labs for the second half of the semester with comparable activities that students could perform at home, such as prepared simulations, student programming, and simple at-home experiments such as refraction through glass and water. We rewrote the corresponding laboratory report assignments as well. In addition, I had to rewrite or revise all of the lectures, which previously depended heavily on in-class demonstrations and interactive, hands-on tutorials. Together, because I made every effort to make the remote environment as accessible and compelling as in-class activities, these course revisions required an even greater workload than writing the lectures and labs from scratch for a new, in-person class.

Furthermore, implementing midterm exams and in-class quizzes in Zoom and Canvas for such a large class took as much time as the lecture preparation, due to the prevalence of online solutions for every available test and problem set. The priority given to academic integrity, in the midst of the sudden shift to

remote teaching, led to an increase in workload that brought other activities to a standstill.

F. Other:

Graduate Research Mentoring, Undergraduate Research Mentoring, Physics Department. San Marcos, TX. 1. (January 1, 2020 - May 15, 2020).

Additional Comments: Student: Charles Condos, research lab assistant, 2018 - fall 2019; continuing as graduate visiting scholar in my group, spring 2020, until he was accepted into the PhD program at the University of Arizona.

Graduate Research Mentoring, Undergraduate Research Mentoring, Physics Department. San Marcos, TX. 1. (May 15, 2019 - May 15, 2020).

Additional Comments: Student: Elijah Lalonde: independent study, summer 2018; research assistant, fall 2018 - spring 2019; continuing as MS student and visiting scholar through spring 2020, when he was accepted to the aerospace PhD program at UT San Antonio.

Graduate Students. Notre Dame, IN, United States. 4. (2009 - 2016).

Additional Comments: Chad Stephenson (PhD 2015), now at Sandia National Lab (last update April 2023).
William O'Brien (PhD 2016), now at Intel (last update April 2023).
Meng Qi (MS 2012).
Victor Patel (MS 2013)

Guest Lecture, Experimental Methods (PHYS 5304) rotation, Physics Department. San Marcos, TX, United States. 2. (November 30, 2020 - December 13, 2020).

Additional Comments: I was one of 7 faculty members each supervising a two week rotation for students in PHYS 5304 (Experimental Methods). Due to the uptick in COVID cases at the end of the semester, my section ended up being a remote Zoom presentation by me plus a series of reading materials on the crystal growth of semiconductors.

High School Teachers, Research Experience for Teachers, National Science Foundation. Notre Dame, IN, United States. 3. (2013 - 2015).

Additional Comments: Mentor and director for summer research experience:
Ms. Heather Nimon: NSF RET teacher, summer 2013.
Ms. Brenda Mueller: NSF RET teacher, summer 2014.
Mr. Greg Alberding: NSF RET teacher, summer 2015.

Mentoring of Post-Doctoral Associates, Undergraduate Research Mentoring, Physics Department. San Marcos, TX, United States. 1. (September 1, 2018 - April 10, 2019).

Additional Comments: Dr. Kiran Dasari.

Mentoring of Post-doctoral Associates. Notre Dame, IN, United States. 3. (2010 - 2017).

Additional Comments: Supervision and mentoring of postdoctoral scholars:
Wu Bin (now at Sandisk Electronics).
Miriam Gillett-Kunnath (now at University of Syracuse).
Chad Stephenson (now at Sandia National Laboratory).

Mentoring of Undergraduate Students, (various). Notre Dame, IN, United States. 24. (2010 - 2016).

Additional Comments: Mentoring and supervising undergraduate students in multiple research capacities, including independent study courses and summer research fellowships:
Sara Miyako Taylor (ND '12): EE 48499.
George Warner (ND '11): lab assistant 2010-2011.
Kuijun Liang (ND '12): NURF 2011.
Michael McSorley (ND '11): lab assistant 2010.
Aaron Stewart (ND '13): lab assistant 2010-2011.
Steven Cress (ND '13): NURF 2011, EE 48499, fall 2011.
Alex Toombs (ND '13): lab assistant 2011-2012.
Nicholas Ferruolo (ND '13): lab assistant 2011-2012.
Rose Doerfler (ND '15): lab assistant, 2012.
Anthony "A.J." Erdman (ND '13): NURF 2012.
Jung Whan (Stephen) Kim (ND '13): EE 48499, fall 2012.
Sean Baur (ND '13): NURF 2012; lab assistant, fall 2012.
John Mullaney (ND '13): lab assistant, summer & fall 2012.
Sam Bruce (ND '13'): lab assistant, summer 2013.
Veronica Martinez (ND '14): Balfour- Hesburgh research scholar, summer 2013.
Katie Loughran (ND '16): NURF research fellow, summer 2013.
Alex Wentzel (ND '15): lab assistant (spring) and Slatt research scholar (summer) 2013.
Patrick Whalen (ND '15): lab assistant, summer 2013.
Matthew Henne (ND '15): NURF 2014.
Hamim Nigena (Morehouse College, a Historically Black College): Slatt Scholar, 2014.
Kathryn D'Alessandro (ND '18): lab assistant and NSF REU, 2015.
Albert Pucci (ND '17): lab assistant and NURF 2015.
Anne Conover (ND '17): lab assistant, 2015-16.
Ben Wdowik (ND '18): lab assistant, fall 2016.

Mentoring toward publication of research, Graduate Research Mentoring. San Marcos, TX, United States. 6. (May 11, 2022 - Present).

Additional Comments: Helping students from Thin Films / Nanodevices class write up their results as a complete research paper for submission to a peer-reviewed research journal after the course was over. Students: Jibesh Saha, Saif Al Arafin Taqy, Imteaz Rahaman, and Pallab Sarkar, with

contributions from Tuhin Dey, Augustus Arbogast. Initial submission to IEEE was rejected, so we are waiting for additional data (semiconductor growths and fabrication) to strengthen the evidence that the group of students did indeed create outstanding contacts to this new semiconductor (GeC/GeCSn).

Undergraduate Research Mentoring, Undergraduate Research Mentoring, Physics Department. San Marcos, TX, United States. 1. (May 22, 2023 - Present).

Additional Comments: Student: Edna Vasquez, undergraduate research lab assistant, May 2023-present.

Undergraduate Research Mentoring, Undergraduate Research Mentoring, Physics Department. San Marcos, TX. 1. (February 1, 2022 - Present).

Additional Comments: Student: Ahmed Ogunjobi, undergraduate research lab assistant, February 2022-present.

Undergraduate Research Mentoring, Undergraduate Research Mentoring, Physics Department. San Marcos, TX. 1. (August 10, 2021 - Present).

Additional Comments: Student: Layne Sauer, undergraduate research lab assistant, Fall 2021-present.

Undergraduate Research Mentoring, Undergraduate Research Mentoring, Physics Department. San Marcos, TX. 1. (January 15, 2021 - December 15, 2021).

Additional Comments: Student: Robert Hill, undergraduate independent study, spring - fall 2021.

Undergraduate Research Mentoring, Undergraduate Research Mentoring, Physics Department. San Marcos, TX. 1. (August 15, 2020 - July 1, 2021).

Additional Comments: Student: Nolan Groves, independent study and visiting graduate scholar.

Undergraduate Research Mentoring, Undergraduate Research Mentoring, Physics Department. San Marcos, TX. 1. (October 1, 2017 - December 31, 2020).

Additional Comments: Student: Augustus (Gus) Arbogast. Undergraduate lab assistant from 2017, later MS (thesis) student. Graduated BS TXST in 2020, MS TXST in 12/2022.

Undergraduate Research Mentoring, Undergraduate Research Mentoring, Physics Department. San Marcos, TX. 1. (May 15, 2019 - August 15, 2020).

Additional Comments: Student: Nolan Groves, undergraduate research lab assistant, spring 2019-summer 2020. Also independent study, fall 2020 - spring 2021.

Undergraduate Research Mentoring, Undergraduate Research Mentoring, Physics Department. San Marcos, TX. 1. (June 1, 2018 - May 15, 2020).

Additional Comments: Student: Alejandra Medina. Research lab assistant, summer 2018 - spring 2020.

Undergraduate Research Mentoring, Undergraduate Research Mentoring, Physics Department. San Marcos, TX. 1. (June 19, 2019 - May 3, 2020).

Additional Comments: Mitchell Foltz: research lab assistant, spring 2019-spring 2020.

Undergraduate Research Mentoring, Undergraduate Research Mentoring, Physics Department. San Marcos, TX. 1. (April 23, 2018 - December 31, 2019).

Additional Comments: Student: Charles Condos, research lab assistant, 2018 - fall 2019; continuing as visiting scholar in my group, spring 2020.

Undergraduate Research Mentoring, Undergraduate Research Mentoring, Physics Department. San Marcos, TX. 1. (May 4, 2019 - August 15, 2019).

Additional Comments: Student: Kyle Mueller, undergraduate research lab assistant, spring-summer 2019.

Undergraduate Research Mentoring, Undergraduate Research Mentoring, Physics Department. San Marcos, TX. 1. (September 1, 2018 - May 15, 2019).

Additional Comments: Student: Elijah Lalonde: independent study, summer 2018; research assistant, fall 2018 - spring 2019; continuing as visiting scholar through spring 2020.

Undergraduate Research Mentoring, Undergraduate Research Mentoring, Physics Department. San Marcos, TX. 1. (September 1, 2018 - December 15, 2018).

Additional Comments: Student: Caroline Soechting: undergraduate research lab assistant, summer 2018; continued as independent study researcher, fall 2018.

Undergraduate Research Mentoring, Undergraduate Research Mentoring, Physics Department. San Marcos, TX. 1. (June 1, 2018 - August 31, 2018).

Additional Comments: Student: Caroline Soechting: undergraduate research lab assistant, summer 2018; continued as independent study researcher, fall 2018.

Undergraduate Research Mentoring, Undergraduate Research Mentoring, Physics Department. San Marcos, TX. 1. (June 1, 2018 - August 31, 2018).

Additional Comments: Student: Noel Gamez: undergraduate research lab assistant, summer 2018.

Undergraduate Research Mentoring, Undergraduate Research Mentoring, Physics Department. San Marcos, TX. 1. (June 1, 2018 - August 31, 2018).

Additional Comments: Student: Elijah Lalonde: independent study, summer 2018; research assistant, fall 2018 - spring 2019; continuing as visiting scholar through spring 2020.

Undergraduate Research Mentoring, Undergraduate Research Mentoring, Physics Department. San Marcos, TX. 1. (June 1, 2018 - August 15, 2018).

Additional Comments: Student: Jose Silva, undergraduate research lab assistant, summer 2018.

Undergraduate Research Mentoring, Undergraduate Research Mentoring, Physics Department. San Marcos, TX. 1. (May 15, 2018 - August 15, 2018).

Additional Comments: Student: Mark Roseman: undergraduate research lab assistant, summer 2018.

Undergraduate research mentoring, Undergraduate Research Mentoring, Physics Department. San Marcos, TX, United States. 1. (May 22, 2023 - September 8, 2023).

Additional Comments: Student: Emma Die, undergraduate research lab assistant, Summer 2023. She felt overcommitted this fall and had to cut her research hours.

Student Accomplishments:

Award:

Supervisor, Best Student Manuscript Award. "Self-assembled Ge QDs Formed by High-Temperature Annealing on Al(Ga)As (001)," 2014 Electronic Materials Conference. Status: Completed. (2014). Electrical Engineering, University of Notre Dame.
Student(s): William O'Brien, Doctoral, Ph.D.

Supervisor, Best Poster award. "Stability of Tensile-strained Ge Studied by Transmission Electron Microscopy," International SiGe Technology and Device Meeting (ISTDM). (2012). Electrical Engineering, University of Notre Dame.
Student(s): Meng Qi, Graduate, MS.

Fellowship:

Supervisor, Doctoral Research Support Fellowship. "Growth and Characterization of Direct Bandgap Germanium Tin Carbide (Ge(1-x-y)SnxCy) for Lasers and Amplifiers." Status: In Progress.

(December 22, 2021). Materials Science, Engineering, and Commercialization (MSEC), Texas State University.
Student(s): Tuhin Dey, Doctoral, Ph.D.

Supervisor, Doctoral Research Support Fellowship. "Direct Bandgap GeC for active Silicon Photonics Applications." Status: Completed. (December 17, 2020). Materials Science, Engineering, and Commercialization (MSEC), Texas State University.
Student(s): Md. Shamim Reza, Doctoral, Ph.D.

Supervisor, Notre Dame Energy Fellowship. Status: Completed. (2015). Electrical Engineering, University of Notre Dame.
Student(s): Chad Stephenson, Doctoral.

Supervisor, Eilers Graduate Fellowship. Status: Completed. (2012). Electrical Engineering, University of Notre Dame.
Student(s): Victor Patel.

III. SCHOLARLY/CREATIVE

A. Works in Print (including works accepted, forthcoming, in press):

1. Books:

d. Chapters in Books:

Refereed:

Harris Jr., J. S., Wistey, M. A., Bank, S., Goddard, L., Lordi, V., Bae, H., & H, Y. (2004). Long-Wavelength Dilute Nitride-Antimonide Lasers. In M. Henini (Ed.), *Dilute Nitride (III-N-V) Semiconductors: Physics and Technology*. Taylor & Francis.

Harris Jr., J. S., Wistey, M. A., Bank, S., Lordi, V., Gugov, T., Bae, H., & Goddard, L. (2004). Long-Wavelength Dilute Nitride-Antimonide Lasers. In M. Henini (Ed.), *Dilute Nitride (III-N-V) Semiconductors: Physics and Technology*. Taylor & Francis.

2. Articles:

a. Refereed Journal Articles:

Stephenson, C. A., O'Brien, W. A., Qi, M., Penninger, M., Schneider, W. F., & Wistey, M. A. (2016). Band Anticrossing in Dilute Germanium Carbides

Using Hybrid Functionals. *J. Electronic Materials*, *45*(4), 2121–6. https://doi.org/10.1007/s11664-015-4300-9

Additional Comments: http://arxiv.org/abs/1410.8383

https://doi.org/10.1063/5.0168596
RithvikAPL2023 asym QW nonlinear-1.pdf
Additional Comments: Wistey helped supervise the computational (ab-initio) materials modeling to interpret the experimental results.

Dey, T., Arbogast, A. W., Meng, Q., Reza, M. S., Muhowski, A. J., Cooper, J., … Wistey, M. A. (2023). Influence of H on Sn Incorporation in GeSnC Alloys Grown Using Molecular Beam Epitaxy. *Journal of Applied Physics*, *134*(19), 193102. https://doi.org/https://doi.org/10.1063/5.0173429
193102_1_5.0173429-1.pdf
Additional Comments: Paper selected as Editor's Pick.

Reza, M. S., Dey, T., Arbogast, A. W., Muhowski, A. J., Holtz, M. W., Stephenson, C. A., … Wistey, M. A. (2023). Growth of Tin-Free Germanium Carbides Using Carbon Tetrabromide (CBr4). *J. Appl. Phys.*, *134*, 183103. https://doi.org/10.1063/5.0172330https://doi.org/10.1063/5.0172330
Accepted-JAP23-AR-03406-1.pdf

Dey, T., Reza, M. S., Arbogast, A. W., Holtz, M. W., Droopad, R., Bank,Seth R., & Wistey, M. A. (2022). Molecular beam epitaxy of highly crystalline GeSnC using CBr4 at low temperatures. *Applied Physics Letters*, *121*(12), 122104. https://doi.org/10.1063/5.0102093https://doi.org/10.1063/5.0102093

Meng, Q., El-Jaroudi, R., White, R., Dey, T., Reza, M. S., Bank, S. R., & Wistey, M. A. (2022). Effects of B and In on the Band Structure of BGa(In)As Alloys. *J. Appl. Phys.*, *132*(19), 193104. https://doi.org/10.1063/5.0125109
MengJAP2022 BGaInAs band effects-1.pdf

Gulyas, I., Stephenson, C. A., Meng, Q., Bank, S. R., & Wistey, M. A. (2021). The Carbon State in Dilute Germanium Carbides. *Journal of Applied Physics*, *129*, 055701. https://doi.org/10.1063/1.5112057https://aip.scitation.org/doi/full/10.1063/1.5112057
JAP19-AR-HMA2019-03331-1.pdf

Kudrawiec, R., Polak, M. P., McNicholas, K. M., Kopaczek, J., Wistey, M. A., & Bank, S. R. (2020). Bowing of the band gap and spin-orbit splitting energy in BGaAs. *Materials Research Express*, *6*(12). https://doi.org/10.1088/2053-1591/ab62e9https://iopscience.iop.org/article/10.1088/2053-1591/ab62e9/meta
Kudrawiec_2019_Mater._Res._Express_6_125913-1.pdf
Additional Comments: I contributed intellectual ideas and suggestions how to model the material in VASP.

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Additional Comments: I initiated and supervised this computational modeling paper.

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Gus-EMC2022 Presentation v1-1.pptx
GeSnC MQW Growth and PL_MW1-1.docx

Meng, Q. (Primary Author), Dey, T. (Author), Reza, M. S. (Author), Wistey, M. A., 64th Electronic Materials Conference, "Mechanical and electronic effect of B on the band structure of BGaAs alloys," Electronic Materials Conference, The Ohio State University, Columbus, OH, United States. (June 29, 2022).
Qian Meng_v3_main-1.pptx
QM_EMC2022_abstract_V3_MAW1-1.docx
QM_emc2022_plots_V4_MAW1-1.docx

Dey, T. (Author), Reza, M. S. (Author), Arbogast, A. W. (Author), Wistey, M. A., 64th Electronic Materials Conference, "Undoing Band Anticrossing in Highly Mismatched Alloys," Electronic Materials Conference, The Ohio State University, Columbus, OH, United States. (June 29, 2022).
EMC2022 BAC-NN arrangement-1.pdf
EMC2022 BAC-NN arrangement p2-1.pdf
EMC2022 Undo BAC-1.pdf

Dey, T. (Author - Primary), Reza, M. S. (Author), Arbogast, A. W. (Author), Wistey, M. A. (Author - Corresponding), 21st International Conference on Molecular Beam Epitaxy (ICMBE), "Effects of CBr4 in Growth of GeSn(C)," ICMBE, (virtual), Puerto Vallarta, Mexico. (September 6, 2021).
21ICMBE_Dey_Tuhin_9027_Tuhin_V1_MAW2_Tuhinv2-2.pdf

White, R. C. (Author - Primary), Meng, Q. (Author), Lopez, M. (Author), El-Jaroudi, R. H. (Author), Ponnekanti, A. (Author), Nordin, L. J. (Author), Muhowski, A. J. (Author), Wasserman, D. (Author), Bank, S. R. (Author), Wistey, M. A. (Author), 21st International Conference on Molecular Beam Epitaxy (ICMBE), "Growth and Characterization of InSb(1−x)Bi(x): A (Potentially) Not So Highly Mismatched Alloy for Wavelength Extension on InSb," International Conference on Molecular Beam Epitaxy (ICMBE), (virtual), Puerto Vallarta, Mexico. (September 6, 2021).
ICMBE_InSbBi_RCW-1.docx

Reza, M. S. (Author), Dey, T. (Author - Primary), Arbogast, A. W. (Author), Holtz, M. W. (Author), Wistey, M. A. (Author - Corresponding), 21st International Conference on Molecular Beam Epitaxy (ICMBE), "Growth of GeSnC With Highly Substitutional Carbon using CBr4 gas source," ICMBE, (virtual), Puerto Vallarta, Mexico. (September 6, 2021).
21ICMBE_Reza_Md.Shamim_9063-1.pdf
ICMBE Shamim Reza_v6_MAW1-1.pptx

Meng, Q. (Primary Author), El-Jaroudi, R. H. (Author), Gulyas, I. A. (Author), White, R. C. (Author), McNicholas, K. M. (Author), Dey, T. (Author), Bank, S. R. (Author),

Wistey, M. A. (Author), 63rd Electronic Materials Conference, "Effect of B Distribution on the Band Structure of BGa(In)As Alloys," Electronic Materials Conference. (June 24, 2021).
FF04_Qian Meng_Effect of B Distribution on the Band Structure of BGa(In)As Alloys-1.pptx
Qian Meng_2021EMC abstract_final-1.docx

Reza, M. S. (Author - Primary), Gulyas, I. (Author), Wistey, M. A. (Author), 2021 IEEE Photonics Society Summer Topicals Meeting, "Mid-IR Gain of Tensile Germanium Waveguide Lasers with SiNx Stress Liners," IEEE Photonics Society. (June 24, 2021).
SUM_2021_Presentation_SR3-1.pptx

Meng, Q. (Author), Bank, S. R. (Author), Dey, T. (Author), Reza, M. S. (Author), Wistey, M. A. (Author - Primary), 63rd Electronic Materials Conference, "Optical Properties and Band Structures of Strained Ge:C," Electronic Materials Conference. (June 24, 2021).
EMC2021 GeC optical 3.14.24 PM-1.pptx
EMC2021 GeC optical-2.pdf
EMC2021 GeC optical p2-1.pdf

White, R. C. (Author), El-Jaroudi, R. H. (Author), Meng, Q. (Primary Author), Dhingra, P. (Author), Lee, M. L. (Author), Bank, S. R. (Author), Wistey, M. A. (Author), 62nd Electronic Materials Conference, "Annealing effects on B III-V alloys," Electronic Materials Conference, Columbus, OH, United States. (June 24, 2020).

Meng, Q. (Primary Author), El-Jaroudi, R. H. (Author), Gulyas, I. A. (Author), White, R. C. (Author), McNicholas, K. M. (Author), Dey, T. (Author), Bank, S. R. (Author), Wistey, M. A. (Author), 62nd Electronic Materials Conference, "Effect of B-In interactions on the band structure and optical properties of BGa(In)As," Electronic Materials Conference, Columbus, OH, United States. (June 24, 2020).

Gulyas, I., Wistey, M. A., Electronic Materials Conference, "Ab Initio Calculations of BAs-GaAs Alloys," Electronic Materials Conference, University of Michigan, Ann Arbor, MI, United States. (June 26, 2019).

Gulyas, I., Wistey, M. A., Electronic Materials Conference, "Accurate Unfolding of Germanium Carbide Band Structures," Electronic Materials Conference, University of Michigan, Ann Arbor, MI, United States. (June 26, 2019).

Spruytte, S. G B., Wistey, M. A., Larson, M. C., Coldren, C. W., Garrett, H., Harris Jr, J. S., Photonics West 2001, "1.3 μm Opto-electronic Devices on GaAs using Group III-Nitride-Arsenides," San Jose, CA, United States. (2001).

Additional Comments: Proc. SPIE, vol. 4286, pp. 22–33.

Wistey, M. A., Kallman, J., Proceedings of the National Conf. on Undergraduate Research, "Optimization of Photoreceiver Designs." (1994).

2. Invited Talks, Lectures, and Presentations:

Wistey, M. A., "Is There Life After Silicon? Hybrid Integrated Materials for the Internet of Things," MRC Distinguished Lecture Series, University of Texas Austin, Austin, TX, United States. (July 20, 2018).

Wistey, M. A., IEEE Summer Topicals, "Band Structure of Germanium Carbides for Direct Bandgap Photonics," Newport Beach, CA, United States. (July 12, 2016).

Wistey, M. A., Ms. Brenda Mueller's environmental sciences class, "Solar power lectures and demonstrations," Elkhart Memorial High School. (2015).

Wistey, M. A., OpTec Colloquium, "Advanced Group IV Photonics and Solar Cells," Bozeman, MT, United States. (February 5, 2015).

Wistey, M. A., Northrop Grumman New Semiconductors and Devices Workshop, "Advanced Group IV Photonics and Solar Cells," Torrance, CA, United States. (December 11, 2014).

Wistey, M. A., American Vacuum Society, "Challenges and Progress in Complementary Tunnel FETs." (2013).

Wistey, M. A., Saturday Science lecture preceding Notre Dame football game, "Solar Power at Long Last. Or, These Cells Had Better Last!." (November 23, 2013).

Wistey, M. A., 30th North American Conf. on Molecular Beam Epitaxy (NAMBE),, "Development of Device Quality Dilute Nitrides," Alberta, Canada. (October 2013).

Wistey, M. A., 30th North American Conf. on Molecular Beam Epitaxy (NAMBE),, "What Arsine Smells Like (and other things you wish you didn’t know)," MBE safety, The Art of MBE Workshop, Canada. (October 2013).

Wistey, M. A., New Approaches to Photon Energy Harvesting Workshop, "Core-Shell Upconverting Nanostructures," University of Delaware. (May 15, 2013).

Wistey, M. A., Department of Electrical Engineering, "What Moore Missed -- Is there life after transistors?," University of Notre Dame, Notre Dame, IN, United States. (March 18, 2009).

Wistey, M. A., Department of Electrical and Computer Engineering, "What Moore Missed -- Is there life after transistors?," University of Utah, Salt Lake City, UT, United States. (March 13, 2009).

Wistey, M. A., Department of Materials Science and Engineering, "What Moore Missed -- Is there life after transistors?," University of Texas at Dallas, Dallas, TX, United States. (March 4, 2009).

Wistey, M. A., Lockheed Martin ATC Colloquium, "GaInNAs on GaAs: Fiber Optics Lasers for the Masses." (February 5, 2004).

5. Other Works not in Print:

a. Works "submitted" or "under review":

Journal Articles:

Meng, Q., Bank, S. R., & Wistey, M. A. (Submitted / Under Review). Undoing Band Anticrossing in Highly Mismatched Alloys by Atom Arrangement. *Appl. Phys. Lett.* (October 2, 2023)
Qian Meng-undo-BAC-draft-V6_MW3_QM3-1.pdf
Additional Comments: I am the primary technical advisor for this Ph.D. student at UT Austin. This paper is based on my computational modeling of 3 different highly-mismatched alloys (HMAs). I showed that the surprising and unusual electronic properties of HMAs are common whether the mismatched atom is an anion, cation, or fully covalent, yet the HMA effects can be canceled out by rearranging atoms in the solid. This paper was submitted to a special issue of the journal in memory of Wladek Walukewicz at UC Berkeley, who first recognized the unusual properties of several HMAs. At last report (late January, 2024), the paper has been accepted with minor revisions.

b. Works "in progress":

Journal Articles:

Additional Comments: Wistey helped supervise the ab-initio materials modeling to interpret the experimental results.

Reza, M. S., Dey, T., Arbogast, A. W., Meng, Q., Holtz, M. W., Bank, S. R., & Wistey, M. A. (In Preparation; Not Yet Submitted). Confinement and Threshold Modeling for High Temperature GeSn and GeC/GeCSn Lasers. *Adv. Opt. Mater.*

Reza, M. S., Stephenson, C. A., O'Brien, W. A., Qi, M., & Wistey, M. A. (In Preparation; Not Yet Submitted). Mid-IR Gain Calculations of Tensile Germanium Waveguide Lasers with SiNx Stress Liner. *IEEE Photon. Technol. Lett.*

Additional Comments: Work on this manuscript was halted by COVID outbreak through 2020. The student graduated and started work at Intel but resumed work on the manuscript in Fall, 2023.

Arbogast, A. W., Dey, T., Adhikari, S., Sedai, P., Reza, M. S., Muhowski, A., … Wistey, M. A. (In Preparation; Not Yet Submitted). Direct Bandgap Emission and Absorption in Dilute GeCSn Alloys. *Optics Letters*.

Saha, J. K., Taqy, S. A. A., Sarkar, P. K., Rahaman, I., Arbogast, A. W., Dey, T., … Wistey, M. A. (In Preparation; Not Yet Submitted). Observation of Low Resistance Al and Ni p-type Ohmic Contacts to Dilute GeC and GeCSn Alloys. *J. Vac. Sci. Technol.-B*.

Additional Comments: This work was led by a group of students in the Thin Films / Nanodevices course using semiconductor materials grown by my research group. It was unsuccessfully submitted to Electron Device Letters. I significantly re-analyzed their data and rewrote the paper for submission to a new journal.

Wistey, M. A., Stephenson, C. A., Olin-Ammentorp, W., Stillwell, R., O'Brien, W. A. A., Kondo, Y., & Seabaugh, A. (In Preparation; Not Yet Submitted). Tunneling Field Effect Transistor Designs using Dilute Germanium Carbides. *IEEE Electron Device Letters*.

Additional Comments: Work on this manuscript was halted by COVID outbreak through 2020. It is expected to resume in spring/summer 2023 with input from new students.

Wistey, M. A., Gulyas, I., & Stephenson, C. A. (In Preparation; Not Yet Submitted). Convergence of Ab-initio Models of a Highly Mismatched Alloy, Ge:C. *Journal of Electronic Materials*.

Additional Comments: Additional work on this manuscript for resubmission to another journal was halted by the COVID outbreak through 2020 and will resume after NSF grant proposals are submitted (late 2023).

c. Other Works Not in Print:

Posters:

Rodriguez, L. (corresponding author), Scolfaro, L. M. (co-author), Wistey, M. A. (co-author), Welch, E. (co-author), Geerts, W. J. (co-author), Graduate Research Conference TxState, "Ab initio Computational Modeling of Surface Supercells of Halide Perovskites.," Graduate College, Texas State University, San Marcos, TX, United States. (April 4, 2023).

Sauer, L., Arbogast, A. W., Dey, T., Holtz, M. W., Wistey, M. A., Texas PREM Conference, "Polarization Dependent Raman of GeCSn for Defect Identification," NSF / TXST PREM, Texas State University, San Marcos, TX, United States. (March 31, 2023).
18 - Layne poster reformatted-1.pdf

Sauer, L., Arbogast, A. W., Dey, T., Holtz, M. W., Wistey, M. A., CDCM MRSEC 2023 Annual Meeting and Industry Day, "Polarization Dependent Raman of GeCSn for Defect Identification," NSF, UT Austin, Austin, TX, United States. (February 28, 2023).
MRSEC presentation draft v2 Layne_MW1-1.pptx

Ogunjobi, A., Hill, R., Arbogast, A. W., Dey, T., Wistey, M. A., CDCM MRSEC 2023 Annual Meeting and Industry Day, "Simple Reduction of Shutter Transients in Molecular Beam Epitaxy," NSF, UT Austin, Austin, TX, United States. (February 28, 2023).
Ahmed_Ogunjobi_CDCM_MRSEC_slide_-1.pptx

Dey, T. (Primary Author and Presenter), Reza, M. S. (Author), Arbogast, A. W. (Author), Wistey, M. A. (Advisor and Editor), CDCM MRSEC Annual Meeting, "Epitaxial Growth of Tensile Strained GeSnC," Virtual. (February 3, 2022).

Wistey, M. A., DARPA: Lasers for Universal Microscale Optical Systems (LUMOS) Proposer's Day, "GeCSn: Strongest Lasers and Smallest Modulators on Si (white paper and poster)," DARPA, Arlington, VA, United States. (November 20, 2019).
DARPA LUMOS GeSnC poster-1.pdf

Reza, M. S., Dasari, K., Gulyas, I., Stephenson, C. A., Wistey, M. A., 2019 Joint Spring Meeting of the APS Texas Section, Texas Section of the American Association of Physics Teachers (AAPT) and Zone 13 of the Society of Physics Students (SPS), "Strained Germanium Waveguide Simulations for Active Silicon Photonics," American Physical Society, Stephen F. Austin State University, Nacogdoches, TX, United States. (March 3, 2019).
Shamim_poster_190306sr2-1.ppt

Workshop with company (AMD) for possible funding and/or collaborations s:

Wistey, M. A., AMD visit, "Device Research at TXST: Cutting-Edge Components for Exascale Computing," COSE, COSE, San Marcos, TX, United States. (September 3, 2021).
Slides for Mark W presentation for AMD v1-1.pdf
AMD Campus Visit Agenda v4[1]-1.docx
Additional Comments: Private workshop hosted by Eric Dean (Corporate Relations Officer) and the College of Science and Engineering to establish possible collaborations, donations, and/or funding from AMD for research on advanced computer devices and architectures being done in the Physics Department. Workshop was held in coordination with the Digital 360 Summit / CIEDAR meeting in San Marcos.

Patents:

Seabaugh, Alan, Fay, Patrick, Xing, Huili (Grace), Zhou, Guangle, Lu, Yeqing, Wistey, Mark A, Koswatta, Siyuranga. "Low Voltage Tunnel Field-Effect Transistor (TFET) and Method of Making the Same". (Date Awarded: 2014).

C. Scholarly / Creative Grants and Contracts:

1. Funded External Grants and Contracts:

Betancourt, Tania (Principal), Brittain, William J (Co-Principal), Irvin, Jennifer A (Co-Principal), Theodoropoulou, Nikoleta (Co-Principal), Martin, Benjamin (Co-Principal), Rhodes, Christopher Peter (Co-Principal), Wistey, Mark A (Co-Principal), Miyahara, Yoichi (Co-Principal), Kerwin, Sean Michael (Co-Principal). TxState-UT PREM Center for Intelligent Materials Assembly (CIMA), National Science Foundation, Federal, $3,822,000.00. (Funded: July 1, 2021 - June 30, 2027). Grant.
Fastlane _ Award-1.pdf
Project Summary-1.pdf
Cover Page-1.pdf
Additional Comments: This is a multidisciplinary proposal bringing together multiple faculty from the College of Science and Engineering.

Within the PREM grant umbrella, each faculty member pursues their own independent research under the shared umbrella of two research thrusts:
1. Reconfigurable Soft Materials: Betancourt, Brittain, Irvin, Kerwin, Miyahara
2. Control of Nanostructure for Energy and Electronics: Martin, Miyahara, Rhodes, Theodoropoulou, Wistey
The research and student researcher mentoring responsibilities are shared equally among these faculty.

In addition to research, the grant also sponsors a number of

educational activities that aim to increase the recruitment, retention, degree attainment and overall success of a diverse student population. Faculty in the grant are involved in these activities to different extents.

Wistey, Mark A (Principal), Percent Contribution: 100%. GeCSn Lasers for Silicon-Based Processors, IR Photonics, and Machine Learning, Air Force Office of Scientific Research, Federal, $685,224.00. (Submitted: May 3, 2023, Funded: August 1, 2023 - July 31, 2026). Grant.

Wistey, Mark A, Percent Contribution: 100%. Germanium Carbide Alloys for Silicon Photonics and Tunneling Devices, National Science Foundation XSEDE, Federal, $45,759.46. (Funded: January 2018 - December 2018). Grant.

Additional Comments: The $45,759.46 represents the equivalent dollar value of computer time and storage units awarded on several supercomputer clusters as follows:
PSC Large Memory (Bridges Large): 5,000.0 SUs
PSC Storage (Bridges Pylon): 1,000.0 GB
SDSC Dell Cluster with Intel Haswell Processors (Comet): 1,238,702.0 SUs
SDSC Medium-term disk storage (Data Oasis): 3,000.0 GB
TACC Dell/Intel Knights Landing System (Stampede2 Phase 1): 826.0 Node Hours
TACC Long-term tape Archival Storage (Ranch): 500.0 GB

Wistey, Mark A (Principal), Percent Contribution: 100%. Core-shell Upconverting Nanostructures (CSUNs) for Photovoltaics, National Science Foundation, Federal, $142,381.00. (Funded: July 1, 2017 - August 31, 2018). Grant.

Additional Comments: Originally $365,865 at Notre Dame. Remaining $142,381 grant funding transferred to Texas State effective July 1, 2017.

Wistey, Mark A (Principal), Percent Contribution: 100%. SusChEM: Direct Bandgap Ge:C on Silicon for Optoelectronics, National Science Foundation, Federal, $243,170.00. (Funded: July 1, 2017 - June 30, 2018). Grant.

Additional Comments: Originally $285,000 at University of Notre Dame. Balance of $243,170 was transferred to Texas State University for work beginning July 1, 2017.

Wistey, Mark A, Percent Contribution: 100%. Optoelectronic Properties of Dilute Germanium Carbides, National Science Foundation XSEDE, Federal, $69,208.00. (Funded: April 1, 2016 - September 30, 2017). Grant.

Additional Comments: 1,298,229 supercomputer cluster service units (SUs) plus storage space, total worth $69,208.

Wistey, Mark A (Principal), Percent Contribution: 100%. SusChEM: Direct Bandgap Ge:C on Silicon for Optoelectronics, National Science Foundation, Federal, $41,830.00. (Funded: July 1, 2015 - June 30, 2017). Grant.

Additional Comments: Originally $285,000 at University of Notre Dame. Balance of $243,170 was transferred to Texas State University for work beginning July 1, 2017.

Wistey, Mark A (Principal), Percent Contribution: 100%. Core-shell Upconverting Nanostructures (CSUNs) for Photovoltaics, National Science Foundation, Federal, $223,484.00. (Funded: September 1, 2014 - June 30, 2017). Grant.

Additional Comments: Originally $365,865. Remaining $142,381 grant funding transferred to Texas State effective July 1, 2017.

Wistey, Mark A (Principal). Optoelectronic Properties of Dilute Germanium Carbide, National Science Foundation XSEDE, $63,870.00. (Funded: January 1, 2015 - December 31, 2015). Grant.

Additional Comments: 751,577.0 supercomputer cluster service units (SUs)

Wistey, Mark A (Co-Principal), Percent Contribution: 5%. Midwest Initiative for Nanoelectronics Discovery (MIND 1.5), Semiconductor Research Corporation, Other, $2,200,986.00. (Funded: January 1, 2011 - December 31, 2012). Grant.

Additional Comments: Energy-Efficient Devices and Architectures Based on Tunneling and Nanomagnetics. Led to 1 patent.

2. Submitted, but not Funded, External Grants and Contracts:

Haque, Ariful, Droopad, Ravindranath, Holtz, Mark W, Piner, Edwin L, Geerts, Wilhelmus J, Chen, Yihong, Hudnall, Todd W, Wistey, Mark A, Miyahara, Yoichi, Smith, Casey Eben, Mahato, Dip Narayan, Rastogi, Shiva Kumar, Kim, Namwon. Acquisition of a state-of-the-art Photoluminescence Spectrometer for Materials Characterization in Research and Education, Department of Defense, Federal, $434,519.00. (Submitted: September 2023). Grant.

Wistey, Mark A (Principal), Percent Contribution: 50%, Bank, Seth R. (Co-Principal), Percent Contribution: 40%, Zakhidov, Alexander (Co-Principal), Percent Contribution: 10%. Designer Semiconductors for

Energy-Ratcheting Photovoltaic Upconversion, Department of Energy, Federal, $300,000.00. (Submitted: June 18, 2020). Grant.

Wistey, Mark A (Principal), Percent Contribution: 25%, Ngu, Hee Hiong (Co-Principal), Percent Contribution: 25%, Weigum, Shannon E (Co-Principal), Percent Contribution: 20%, Benavides, Elizabeth Ashley (Co-Principal), Percent Contribution: 20%, Holtz, Mark W (Co-Principal), Percent Contribution: 10%. Machine Learning for Early Anemia Detection (concept paper), Keck Foundation, Private / Foundation / Corporate, $1,000,000.00. (Submitted: December 20, 2019). Gift.

Additional Comments: This was a concept paper and was discouraged for a full proposal. However, a full proposal might still be possible with emphasis on more fundamental research that is not being funded federally.

Note that the percent contributions of each individual are very approximate, as this pre-proposal had not gone to the full proposal stage, where individual roles would have been better delineated.

Hudnall, Todd W (Co-Principal), Percent Contribution: 20%, Wistey, Mark A (Principal), Percent Contribution: 80%. Sn-Enhanced Ge:C for Near and Mid Infrared Photonics, National Science Foundation, Federal, $494,000.00. (Submitted: November 3, 2019). Grant.

Wistey, Mark A, Percent Contribution: 80%, Hudnall, Todd (Co-Principal), Percent Contribution: 20%. Sn-Enhanced Ge:C for Near and Mid Infrared Photonics, National Science Foundation, Federal, $494,000.00. (Submitted: October 31, 2019). Grant.

NSF DMR 2019 submitted-1.pdf

Wistey, Mark A, Percent Contribution: 90%, Zakhidov, Alexander, Percent Contribution: 10%. Energy Ratcheting Upconversion Using Nearly Direct Bandgap Materials, Department of Energy, Federal, $200,000.00. (Submitted: September 9, 2019). Grant.

Additional Comments: This was a joint proposal with Seth Bank's group at University of Texas - Austin. Although the white paper was recommended for a full proposal, the final proposal was not funded.

Wistey, Mark A (Principal), Rhodes, Christopher Peter (Co-Principal), Piner, Edwin L (Co-Principal), Theodoropoulou, Nikoleta (Co-Principal), Garcia, Dana M. Acquisition of Transmission Electron Microscope for Linking Integrated Materials Education and Research (ATELIER), National Science Foundation, Federal, $1,526,000.00. (Submitted: February 2018). Grant.

Wistey, Mark A (Principal), Rhodes, Christopher Peter (Co-Principal), Piner, Edwin L (Co-Principal), Theodoropoulou, Nikoleta (Co-Principal),

Betancourt, Tania, Garcia, Dana M (Supporting), Beall, Gary W (Supporting), Myers, Thomas H (Supporting), Holtz, Mark W (Supporting), Droopad, Ravindranath (Supporting), Geerts, Wilhelmus J (Supporting), Irvin, Jennifer A (Supporting), Zakhidov, Alexander (Supporting), McLean, Robert J C (Supporting). MRI: Acquisition of Transmission Electron Microscope for Linking Integrated Materials Education and Research (ATELIER), Federal, $1,526,000.00. (Submitted: February 2018). Grant.

3. Funded Internal Grants and Contracts:

Wistey, Mark A, Percent Contribution: 12.5%, Chen, Yihong (Co-Principal), Percent Contribution: 12.5%, Weigum, Shannon E, Percent Contribution: 12.5%, Benavides, Elizabeth Ashley, Percent Contribution: 12.5%, Ngu, Hee Hiong, Percent Contribution: 12.5%, Irvin, Jennifer A, Percent Contribution: 12.5%, Betancourt, Tania, Percent Contribution: 12.5%, Holtz, Mark W, Percent Contribution: 12.5%. FEES and Machine Learning for Diagnostics, Texas State University, Texas State University, $10,000.00. (Funded: March 2019 - March 2020). Grant.

Wistey, Mark A (Principal), Percent Contribution: 100%. ND Energy Postdoctoral Fellowship, Notre Dame Energy Center, Institutional (Higher Ed), $56,238.00. (Funded: May 16, 2015 - June 5, 2017). Grant.

Additional Comments: To postdoc Chad Stephenson, renewed 2016.

Wistey, Mark A (Principal), Patel, Victor (Supporting). The Patrick and Jana Eilers Graduate Student Fellowship for Energy Related Research, $13,699.84. (Funded: 2013). Grant.

D. Scholarly / Creative Fellowships, Awards, Honors:

Award / Honor Recipient: Ross N. Tucker Award (IEEE/TMS) for Advancement in Semiconductor Materials.
2004

Award / Honor Recipient: Outstanding Student Paper, North American Molecular Beam Epitaxy Conference.
2003

Award / Honor Recipient: National Science Foundation Graduate Fellowship.
1997 - 2000

Fellowship Recipient: Texts and Critics Junior Fellow, MSU Honors.
1993

Award / Honor Recipient: Barry Goldwater Scholar.
1990 - 1993

Award / Honor Recipient: Presidential Scholar, Montana State University.
1989 - 1993

E. Scholarly / Creative Professional Development Activities Attended:

Workshop, "Enhanced Night Vision in eyeglass form (ENVision)," DARPA, Arlington, VA, United States. (January 21, 2021).

Additional Comments: Effort to connect with industry (system integration) and academic (avalanche photodiode) partners to build a consortium to apply for DARPA ENVIsion program.

Seminar, "Tenure and Promotion to Associate Professor: Advice for Assistant Professors," Texas State University Faculty Development, San Marcos, TX, United States. (September 30, 2020).

Additional Comments: Review of the best ways I can contribute to the specific and strategic goals of the University.

Workshop, "MRSEC Review," National Science Foundation (NSF DMR), Austin, TX, United States. (January 23, 2020).
PREM Research 2020 - Physics-1.pptx
Additional Comments: Presented the Texas State University Physics Department's relevant research as part of a proposal for a DMR Partnerships for Research and Education in Materials Research (PREM) in conjunction with the UT Austin MRSEC. This presentation was part of an ongoing, collaborative preparation by multiple TXST faculty for a full PREM proposal to be submitted in 2021, led by Tania Betancourt. Significant effort on the actual PREM proposal occurred through the end of 2020 and into 2021.

Workshop, "Lasers for Universal Microscale Optical Systems (LUMOS) Proposer's Day," DARPA, Arlington, VA, United States. (November 20, 2019).
DARPA LUMOS GeSnC poster pg-1.pdf
Additional Comments: White paper accepted to present poster at Proposer's Day workshop, in an effort to build a consortium with industry teammates and apply for the DARPA LUMOS program.

IV. SERVICE

A. Institutional

1. University:

Mentor, HSI STEM Impact Program - STEM Undergraduate Research Experience (SURE). (April 29, 2020 - May 2021).

Additional Comments: Mentored SURE student Will Leija in my research group, mostly May-August 2020. Twice-weekly meetings plus interactions with graduate student Qian Meng on interpreting various properties of semiconductors extracted from our simulations. Final poster and presentation expected Spring 2021.

2. College:

Member, COSE Undergraduate College Level Scholarship Committee. (October 31, 2019 - Present).

3. Department/School:

Member, Department Undergraduate Scholarship Committee. (October 31, 2019 - Present).

Graduate research advisor. (August 10, 2017 - Present).

Additional Comments: Graduate students: Dalim Mia, Istvan Gulyas, Md. Shamim Reza, Tuhin Dey, Augustus Arbogast. Between my research group meetings and individual student research meetings, I aim to spend about 1 hour/week per student in mentoring, above and beyond the basic research tasks. This includes things like lab safety talks, Crew Resource Management, short presentations on handling uncertainty and error, discussions about scientific ethics, making sense of odd data, finding jobs, preparing for research careers, working with difficult colleagues (thankfully less of an issue at present), division of credit on scientific papers, reviewing scientific papers, writing grant proposals.

Member, Materials Science, Engineering, and Commercialization (MSEC) admissions committee. (2017 - Present).

Additional Comments: Representative for Physics department

Member, Calculus-based Physics Introductory Sequence Coordinating Committee (ad hoc). (January 12, 2021 - December 31, 2022).

Participant, AMD Campus Visit to COSE. (September 1, 2021 - September 3, 2021).

Slides for Mark W presentation for AMD v1-1.pdf
AMD Campus Visit Agenda v4[1]-1.docx

Additional Comments: Represented Physics department at the visit to campus by representatives of AMD. Presented work on devices that would help AMD (me, Mark Holtz, Eddie Piner) for possible sponsorship/collaborations. I also presented the computational materials modeling being done both by Luisa Scolfaro and my group as a possible donation target from AMD of high performance computing (HPS) resources.

Long discussion with AMD visitor Sudvanha Gurumurthi about the architecture implications of active silicon photonics and possible future collaborations with the department on the future of silicon photonics in HPC/AI. AMD no longer owns their own fabs, so they do not do or fund much device work directly, but they would like to understand the system architecture implications for new devices that we are building at TXST.

Significant preparation time went into understanding the architecture-level needs and goals of AMD's current products and systems, and presenting TXST Physics departmental research to best reflect the fit with AMD's goals.

Member, Graduate Admissions Committee: Department of Electrical Engineering. (2014).

Member, Graduate Admissions Committee: Department of Electrical Engineering. (2011).

Organizer, Solid State Seminar Series. (2010 - 2011).

Additional Comments: Assistant Organizer, 2010.
Organizer, 2011.

Member, Graduate Committee-Department of Electrical Engineering. (2009 - 2011).

Member, Graduate Admissions Committee: Department of Electrical Engineering. (2009).

B. Professional:

Reviewer / Referee, Air Force Office of Scientific Research. (June 26, 2023 - June 27, 2023).

Additional Comments: Reviewed a grant proposal made to AFOSR, including careful study of existing literature on the subject matter.

Coordinator / Organizer, Electronic Materials Conference (EMC). (2015 - 2021).

Additional Comments: Program Committee. 6-year term on the main committee ended in 2021 but continuing as an Invited Organizer.

Reviewer / Referee, Journal of Physical Chemistry. (March 2021).

Reviewer / Referee, Journal of Crystal Growth. (January 8, 2021).

Reviewer / Referee, Journal of Applied Physics. (July 2020).

Additional Comments: Reviewed multiple paper revisions

Reviewer / Referee, Applied Physics Letters. (January 2020).

Reviewer / Referee, Journal of Applied Physics. (July 7, 2019).

Reviewer / Referee, Applied Physics Letters. (February 2019).

Reviewer / Referee, The Electrochemical Society Journals. (November 18, 2018).

Reviewer / Referee, AIP Advances. (July 8, 2018 - July 27, 2018).

Coordinator / Organizer, Device Research Conference (DRC). (2015 - 2017).

Additional Comments: Program Committee

Co-Chair, IEEE Electron Device Society and Photonics Society, Notre Dame chapters, Notre Dame, IN, United States. (2015 - 2016).

Additional Comments: Local chapter co-chair

Proposal Review Panels, Keck Foundation. (2015).

Additional Comments: Written reviews

Proposal Review Panels, National Science Foundation (NSF), Arlington, VA, United States. (2015).

Additional Comments: Three panels in 2015

Member, American Vacuum Society. (2014 - 2015).

Guest Editor, Journal of Vacuum of Science and Technology B special issue. (2012).

Member, Indium Phosphide and Related Materials (IPRM) Conference. (2012).

Proposal Review Panels, National Science Foundation (NSF). (2011).

Member, Electrochemical Society. (2009).

Proposal Review Panels, National Science Foundation (NSF). (2009).

Reviewer / Referee, Applied Physics Letters. (1925).

Reviewer / Referee, IEEE Journal of Photovoltaics. (1925).

Reviewer / Referee, IET Optoelectronics. (1925).

Reviewer / Referee, Journal of Applied Physics. (1925).

Reviewer / Referee, Journal of Crystal Growth. (1925).

Reviewer / Referee, Journal of Electronic Materials. (1925).

Reviewer / Referee, Journal of Physical Chemistry Letters. (1925).

Reviewer / Referee, Journal of Special Topics in Quantum Electronics. (1925).

Reviewer / Referee, Journal of Vacuum Science and Technology A/B. (1925).

Reviewer / Referee, Nature Communications. (1925).

Reviewer / Referee, Physica Status Solidi A. (1925).

Reviewer / Referee, Scripta Materialia. (1925).

Reviewer / Referee, Surface Science. (1925).

C. Community:

High school Siemens competition team consultant, Penn High School. (2012).

D. Organization Memberships:

Member of Electron Device Society and Photonics Society (EDS). (2015 - Present).

Institute of Electrical and Electronic Engineers (IEEE). (2004 - Present).

Additional Comments: Senior Member

Materials Research Society (MRS). (January 1, 2020 - June 30, 2022).

Electronic Materials Conference (EMC). (2012 - 2021).

Additional Comments: EMC Committee Member 2015-2021; Invited Organizer 2012-Present

North American Conference on Molecular Beam Epitaxy (NAMBE). (2012 - 2015).

Additional Comments: Program committee

North American Conference on Molecular Beam Epitaxy (NAMBE). (2010).

Additional Comments: Program committee

E. Service Honors and Awards:

Fellowship Recipient: Advisor of Notre Dame Energy Fellowship award.
2015 - 2017

Award / Honor Recipient: Advisor of the Best Student Manuscript Award, Electronic Materials Conference.
2014

Fellowship Recipient: Advisor of Eilers Graduate Fellowship, Notre Dame.
2012

G. Service Professional Development Activities Attended:

Workshop, "SURE Mentor Training Workshop," HSI STEM Impact, San Marcos, TX, United States. (May 28, 2020 - June 12, 2020).