

## Jay W. McDaniel, Ph.D.

### *Department Address*

University of Oklahoma  
School of Electrical & Computer Engineering  
110 W. Boyd Street  
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### *Work Address*

Advanced Radar Research Center  
Radar Innovations Laboratory  
3190 Monitor Avenue  
Norman, OK 73019  
<https://www.arrc.ou.edu>  
Phone: (405) 325-5072

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### **Education**

*Ph.D.*, August 2018

University of Oklahoma, Electrical & Computer Engineering

Dissertation title:

“Self-Packaged and Low-Loss Suspended Integrated Strip-line Filters for Next Gen. Systems”

*M.Sc.*, May 2015

University of Kansas, Electrical Engineering & Computer Science

Thesis title:

“Design, Integration, and Miniaturization of a Multichannel Ultra-Wideband Snow Radar Receiver and Passive Microwave Components”

*B.Sc.*, May 2013

Kansas State University, Electrical & Computer Engineering

### **Experience**

*Aerospace and Defense Faculty Fellow*, March 2023 – Present

University of Oklahoma, Office of the Vice President for Research and Partnerships, Norman, OK

*Assistant Professor*, August 2018 – Present

University of Oklahoma, School of Electrical & Computer Engineering, Norman, OK

*Primary Instructor*, August 2017 – December 2017

University of Oklahoma, School of Electrical & Computer Engineering, Norman, OK

*Graduate Research Assistant*, July 2016 – August 2018

University of Oklahoma, Advanced Radar Research Center (ARRC), Norman, OK

*Radar Engineer*, May 2015 – July 2016

Kansas City National Security Campus (Honeywell FM&T), Kansas City, MO

*Graduate Research Assistant*, July 2013 – May 2015

University of Kansas, Center for Remote Sensing of Ice Sheets (CReSIS), Lawrence, KS

*Undergraduate Physics Laboratory Coordinator*, August 2012 – May 2013

Kansas State University, Physics Department, Manhattan, KS

*Primary Physics Laboratory Instructor*, August 2011 – May 2012

Kansas State University, Physics Department, Manhattan, KS

*Secondary Physics Laboratory Instructor*, January 2011 – May 2011

Kansas State University, Physics Department, Manhattan, KS

## Research Interests

Electromagnetic field theory; electromagnetic modeling and simulations; RF and microwave component design and fabrication; radar system design for defense, commercial, and remote sensing applications; all-digital phased array radars; and multi-IMU fusion techniques for PNT.

## Mentoring Experience

<i>OK-LSAMP Mentor</i> The University of Oklahoma, Norman, OK	Fall 2020 – Present
<i>Project Threshold Mentor</i> The University of Oklahoma, Norman, OK	Fall 2018 – Present
<i>Graduate Mentor</i> The University of Oklahoma, Norman, OK	July 2016 – August 2018
<i>Research Experience for Undergraduates (REU) Mentor</i> The University of Kansas, Lawrence, KS	May 2014 – August 2014
<i>Graduate Mentor</i> The University of Kansas, Lawrence, KS	July 2013 – May 2015

## Professional Memberships

(\* = current membership)

Institute of Electrical and Electronics Engineers\*  
Member, 2018 – Present  
Student Member, 2011 – 2015, 2016 – 2018

Member of IEEE Microwave Theory and Techniques Society\*

Member of IEEE Electronics Packaging Society\*

Member of IEEE Instrumentation and Measurement Society\*

Member of International Microelectronics and Packaging Society\*

Member of IEEE Aerospace and Electronic Systems Society\*

Member of IEEE Geoscience and Remote Sensing Society

Tau Beta Pi, engineering honor society\*

Eta Kappa Nu, electrical engineering honor society\*

## Professional Service

<i>Technical Program Committee Member</i> 2024 European Microwave Conference	Summer 2023 – Present
<i>Technical Program Committee Co-Chair</i> 2024 IEEE Wireless and Microwave Technology Conference	Summer 2023 – Present

Session Chair - Emerging Planar Filters: from L-band to mm-Waves 2023 IEEE International Microwave Symposium	Summer 2023
Session Chair - Emerging Applications: M2C 2023 IEEE Wireless and Microwave Technology Conference	Spring 2023
Graduate Fellowship Award Committee Chair IEEE Instrumentation and Measurement Society	Spring 2023 & 2024
Associate Editor IEEE Transactions on Radar Systems	Fall 2022 – Present
Technical Paper Review Committee: Planar Passive Filters 2023 IEEE International Microwave Symposium	Fall 2022 / Spring 2023
Paper Competition Chair 2023 IEEE Wireless and Microwave Technology Conference	Spring 2023
Session Chair - High-Density Integration of Transmission Line Structures: We1A 2022 IEEE International Microwave Symposium	Summer 2022
Technical Paper Review Committee: Transmission Line Structures 2022 IEEE International Microwave Symposium	Fall 2021 / Spring 2022
Inaugural MTT-24 Technical Committee Affiliate Member Microwave/mm-wave Radar, Sensing, and Array Systems IEEE Microwave Theory and Techniques Society	Summer 2021 – Present
Session 8 Co-Chair - Radar and Sensing 2021 IEEE Texas Symposium on Wireless & Microwave Circuits and Systems	Spring 2021
Inaugural MTT-4 Technical Committee Affiliate Member Microwave Passive Components and Transmission Line Structures IEEE Microwave Theory and Techniques Society	Spring 2021 – Present
Graduate Fellowship Award Committee Chair IEEE Instrumentation and Measurement Society	Spring 2021 & 2022
Technical Program Steering Committee 2020 IEEE Wireless and Microwave Technology Conference	Spring 2020
Graduate Fellowship Award Committee Member IEEE Instrumentation and Measurement Society	Spring 2019 & 2020
Special Session Chair - UWB Antenna Technologies for Radar 2019 IEEE Antennas and Propagation Conference	Spring 2019
Technical Program Committee 2019 IEEE Antennas and Propagation Symposium	Spring 2019
Session Chair - Passive Components: M1A 2019 IEEE Wireless and Microwave Technology Conference	Spring 2019

*Peer Reviewer:*

IEEE Transactions on Microwave Theory and Techniques (TMTT)

IEEE Transactions on Components, Packaging, and Manufacturing Technology (TCPMT)

IEEE Transactions on Aerospace and Electronic Systems (TAES)

IEEE Microwave and Wireless Component Letters (MWCL)

IET Electronic Letters

IEEE Radar Conference

IEEE Wireless and Microwave Technology Conference (WAMICON)

IEEE International Microwave Symposium

**School Service**

*Undergraduate Research Opportunities Program*

*Mentor*

Fall 2022 – Spring 2023

Mentored ECE undergraduate student Alex Adkisson for his project titled “Design and Development of a Low Cost, Size, Weight, and Power Inertial Navigation System”.

*Undergraduate Research Opportunities Program*

*Mentor*

Fall 2021 – Spring 2022

Mentored ECE undergraduate student Andrew Gonzales for his project titled “3D Synthetic Aperture Radar Demonstrator using Vehicular Radar Evaluation Modules”.

*Undergraduate Research Opportunities Program*

*Mentor*

Fall 2020 – Spring 2021

Mentored ECE undergraduate student Nicole Palmer for her project titled “Design of a Synthetic Aperture Radar Demonstrator using Vehicular Radar Evaluation Modules”.

*ECE Lab Fees Committee 3 Member*

Spring 2019 – Spring 2020

I am currently working with a team to identify lab usage and management as well as identifying lab fees currently charged to students or additional fees needing charged.

*ECE Tenure Track Faculty Resources Committee 5 Member*

Spring 2019 – Spring 2020

I am currently working with another professor to compile a repository of useful documents and templates for tenure track faculty.

*Undergraduate Research Opportunities Program*

*Mentor*

Spring 2019

Mentored ECE undergraduate student Russell Kenney for his project titled “Development of a Compact Synthetic Aperture Radar for Drone Applications”.

*IEEE Student Paper Competition*

*Advisor*

Fall 2018 – Spring 2019

Advised ECE undergraduate student Russell Kenney for his paper titled “Clock Incoherence in All-Digital Radar Back-Ends”. Russell took first place at the OKC local and region 5 north area student paper competitions and took second place at the IEEE Region 5 competition.

*ECE Fields II Lab Development and Funding Acquisition* Fall 2018 – Present

I am currently leading and effort on the development of a Student Microwave Laboratory at the University of Oklahoma to provide experiential learning opportunities to electrical and computer engineering students in the fields of applied electromagnetics, RF/microwave engineering, and radar. Fund-raised over \$600k (\$140k from Tektronix and \$375k from Keysight) to purchase the microwave equipment and necessary components for the lab space.

A University of Oklahoma case study was featured on the Tektronix website here: <https://www.tek.com/solutions/education/case-studies/university-of-oklahoma-case-study>

## College Service

*Galogly College of Engineering Graduate Recruitment Event* Fall 2022

I served as the host for this event which provided prospective graduate students with information about the Galogly College of Engineering at the University of Oklahoma. 52 students attended the event and got to hear from faculty, students, and attended break out sessions for additional information within their respective departments of interest.

*OK-LSAMP Mentor* Fall 2020 – Present

I am currently serving as a faculty mentor for the Oklahoma Louis Stokes Alliance for Minority Participation (OK-LSAMP) at the University of Oklahoma, where underrepresented minorities are provided mentor-ship on undergraduate research experiences, graduate school preparation, and international experiences.

*Students for the Exploration and Development of Space (SEDS) Co-Chair* Fall 2020 – Present

Currently working with co-chair Dr. Justin Metcalf and OU students to build the SEDS OU program, create a constitution and by-laws, and provide connections with space companies for employment and full-time career opportunities. SEDS OU was named the “Best New Chapter of the Year” at the SpaceVision 2020 conference.

*HERE advisor* Spring 2019

I am a faculty participant of the Honor’s Engineering Research Experience (HERE) program. The HERE program facilitates the match process for undergraduates with faculty advisors to encourage undergraduate research.

*Project Threshold Mentor* Fall 2018 – Present

I am currently serving as a faculty mentor for the Project Threshold program at the University of Oklahoma, where first generation and students from economically disadvantaged backgrounds can receive special academic and professional mentoring.

## University Service

*OU OVPRP Aerospace and Defense Faculty Fellow* Spring 2023 – Present

Dr. McDaniel will primarily support research commercialization priorities and innovative defense-focused research efforts coordinated by the OVPRP Director of Strategic Initiatives Drew Allen. Additional duties include working with the OVPRP to help implement the goals, strategies and tactics set forth in the Strategic Research Framework in coordination with the Lead On, University Strategic Plan, as well as liaise with academic colleges and research organizations. Dr. McDaniel will also have the opportunity to engage with Congressional and State legislature staff, relevant local and national defense industrial base companies, and Department of Defense installations such as Tinker Air Force Base, Fort Sill and others.

*ARRC Strategic Planning Committee Member* Fall 2022

Dr. McDaniel served as a committee member on the strategic planning committee for the Advanced Radar Research Center. The outcome of this 5-year strategic plan is to revitalize our mission, vision, and values as well as put forth high-impact goals, objectives, and actions.

*ARRC Recruitment Co-Chair* Fall 2018 – Present

Dr. McDaniel currently serves as co-chair for the recruitment committee at the Advanced Radar Research Center (ARRC) along with Dr. Jessica Ruyle. This includes prioritizing university relations, student travel and tours, and alignment of student interest with ideal faculty.

### **Additional Activities**

*IEEE Microwave Theory and Techniques Society*, The University of Oklahoma, Fall 2016 – Present

*Student Ambassador*, Advanced Radar Research Center, Fall 2016 – Fall 2018

*Student STEM Representative*, Higher Education Day at Oklahoma Capitol, Spring 2016

*Student Ambassador*, Center for Remote Sensing of Ice Sheets, Fall 2013 – Spring 2015

*HKN Beta Kappa Chapter Member*, Kansas State University, Fall 2011 – Spring 2013

*Tau Beta Pi Kansas Gamma Chapter Member*, Kansas State University, Fall 2011 – Spring 2013

*Engineering Ambassador Executive Member*, Kansas State University, Fall 2011 – Spring 2013

*Engineering Ambassadors Selections Chair*, Kansas State University, Fall 2011 – Spring 2012

### **Honors and Awards**

*Award for Excellence in Research Grants - University of Oklahoma*, Spring 2023

*Presented with commander coin from AFMC Lt. Gen. Hawkins for RCS research*, Spring 2023

*Selected as the inaugural 2023 Aerospace and Defense Faculty Fellow at OU*, Spring 2023

*Recipient of the prestigious NSF CAREER Award*, Fall 2022

*Appointed associate editor for the inaugural IEEE Transactions on Radar Systems*, Fall 2022

*Unanimously Elected Inaugural Affiliate Member of the MTT-24 Technical Committee*, Summer 2021

*Award for Excellence in Research Grants - University of Oklahoma*, Spring 2021

*Unanimously Elected Inaugural Affiliate Member of the MTT-4 Technical Committee*, Spring 2021

*Tektronix - Featured Case Study Article for Experiential Learning EM Lab Development*, Fall 2020

*SEDS OU - Best New Chapter of the Year Award*, Fall 2020.

*Top 1% Most Download Article - Wiley Microwave and Optical Technology Letters*, Spring 2020

*IEEE WAMICON 2019 Young Professionals Best Paper Award Finalist*, Spring 2019

*NASA Travel Grant & Invited Lecture*, Marshall Space Flight Center, Huntsville, AL, Spring 2019

*NASA Travel Grant & Invited Lecture*, Goddard Space Flight Center, Greenbelt, MD, Spring 2019  
*Outstanding Graduate Student Award in Research*, The University of Oklahoma, May 2018  
*International Microwave Symposium PhD Student Sponsorship Initiative*, IEEE, April 2018  
*Provost's Graduate Teaching Assistant Award*, The University of Oklahoma, April 2018  
*Provost's Certificate of Distinction in Teaching Award*, The University of Oklahoma, March 2018  
*Advanced Radar Research Center Journal Paper Award*, The University of Oklahoma, February 2018  
*Advanced Radar Research Center Travel Award*, The University of Oklahoma, February 2018  
*Outstanding Paper Award*, Intern. Symp. in Earth-Science Challenges Conf., October 2017  
*Intern. Symp. on Earth-Science Challenges Fellowship*, The University of Oklahoma, August 2017  
*Dolese Teaching Fellowship*, The University of Oklahoma, August 2017  
*Electrical and Computer Engineering Travel Grant*, The University of Oklahoma, March 2017  
*Best Poster Presentation and 1st Place Prize*, The University of Oklahoma, February 2017  
*Electrical and Computer Engineering Travel Award*, The University of Kansas, May 2015  
*Prestigious Richard K. Moore Best Masters Thesis Award*, The University of Kansas, May 2015  
*Highest Honors Graduation for Outstanding Masters Thesis*, The University of Kansas, May 2015  
*NASA-Kansas Space Grant Consortium Fellowship*, The University of Kansas, May 2014  
*Knights of St Patrick's Award*, Kansas State University, May 2013  
*Engineer Ambassador Executive of the Year Award*, Kansas State University, May 2012

## **Certifications**

*ITAR Relative to Research Training*, The University of Oklahoma, Fall 2016  
*Six Sigma Green Belt*, Kansas City National Security Campus, Spring 2016  
*Solder Inspection*, Kansas City National Security Campus, Spring 2016

## **Sponsored Research Projects**

### ***Current:***

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**Title:** Biological Instrument for Robust Detection of Avians using Radar (BIRDAR)  
**Sponsor:** United States Geological Survey (USGS)  
**PIs:** Justin Metcalf, Jay McDaniel, and Jessica Ruyle  
**Award Amount:** \$215,000    **Period of Performance:** 10/01/2023 – 09/30/2026  
**Role:** Co-PI                      **Person-Months/Year:** 0.5

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**Title:** CAREER: UAV-Based Radar Suite for Bulk-Snow Characterization and Risk Management  
**Sponsor:** National Science Foundation (NSF)  
**PIs:** Jay McDaniel  
**Award Amount:** \$625,218    **Period of Performance:** 08/01/2023 – 07/31/2028  
**Role:** PI    **Person-Months/Year:** 0.5

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**Title:** Numerical Modeling for Waveforms - Phase II  
**Sponsor:** DEFENSEWERX  
**PIs:** Justin Metcalf, Jay McDaniel, Jessica Ruyle, and Rachel Jarvis  
**Award Amount:** \$514,000    **Period of Performance:** 07/14/2023 – 06/14/2024  
**Role:** Co-PI    **Person-Months/Year:** 0.5

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**Title:** EAGER: A Technology Demonstrator for a mmWave Rapid Scan Image Phased Array Radar for Cloud Research  
**Sponsor:** National Science Foundation (NSF)  
**PIs:** Jorge Salazar and Jay McDaniel  
**Award Amount:** \$174,988    **Period of Performance:** 07/01/2023 – 06/30/2024  
**Role:** Co-PI    **Person-Months/Year:** 0.25

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**Title:** Military Utility Assessment for an Aerial Autonomous ISR/T & EW Network Organic to the Surface Fleet  
**Sponsor:** Systems Planning and Analysis, Inc. (SPA)  
**PIs:** Jay McDaniel, Justin Metcalf, and Russell Kenney  
**Award Amount:** \$40,528    **Period of Performance:** 07/01/2023 – 02/29/2024  
**Role:** PI    **Person-Months/Year:** 0.5

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**Title:** NISAR Corner Reflector Instrumentation  
**Sponsor:** Jet Propulsion Laboratory (JPL)  
**PIs:** Jay McDaniel  
**Award Amount:** \$5,000    **Period of Performance:** 05/01/2023 – 10/31/2023  
**Role:** Collaborator    **Person-Months/Year:** 0.05

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**Title:** Radar Consortium FY23: The Future of Airborne Radar  
**Sponsor:** Kansas City National Security Campus (KCNSC)  
**PIs:** Jay McDaniel, Hjalti Sigmarsson, Mark Yeary, and Nathan Goodman  
**Award Amount:** \$372,000    **Period of Performance:** 12/11/2022 – 12/31/2023  
**Role:** PI    **Person-Months/Year:** 1.0

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**Title:** Fusion-Based State Estimation for Localization and Synchronization of Distributed Radar Sensor Networks  
**Sponsor:** Office of Naval Research (ONR)  
**PIs:** Jay McDaniel, Justin Metcalf, and Russell Kenney



**Award Amount:** \$725,147    **Period of Performance:** 08/01/2022 – 07/31/2025  
**Role:** PI    **Person-Months/Year:** 1.0

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**Title:** Advanced Comms & RF Systems

**Sponsor:** DEFENSEWERX

**PIs:** Jessica Ruyle, Jay McDaniel, and Justin Metcalf

**Award Amount:** \$250,000    **Period of Performance:** 07/20/2022 – 12/05/2023

**Role:** Co-PI    **Person-Months/Year:** 0.5

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*Pending:*

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**Title:** ONR YIP: A Mathematical Framework for Precise Relative Navigation in Adversarial Environments Using Cooperative Sensor Networks (in-preparation)

**Sponsor:** Office of Naval Research

**PIs:** Jay McDaniel

**Award Amount:** \$749,582    **Period of Performance:** 10/01/2023 – 09/30/2026

**Role:** PI    **Person-Months/Year:** 1.0

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**Title:** Radar Consortium FY24: The Future of Airborne Radar

**Sponsor:** Kansas City National Security Campus (KCNSC)

**PIs:** Jay McDaniel, Hjalti Sigmarsson, Mark Yeary, and Nathan Goodman

**Award Amount:** \$357,000    **Period of Performance:** 12/1/2023 – 11/30/2024

**Role:** PI    **Person-Months/Year:** 1.0

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*Past External Funding:*

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**Title:** Near-field Scanner and Projects for Advanced Digital Radar (ASTROS)

**Sponsor:** Office of Naval Research (ONR)

**PIs:** Nathan Goodman, Jessica Ruyle, Hjalti Sigmarsson, Mark Yeary, Jorge Salazar-Cerreno, Caleb Fulton, Robert Palmer, Jay McDaniel, and Justin Metcalf

**Award Amount:** \$7,405,000    **Period of Performance:** 10/01/2020 – 06/30/2023

**Role:** Co-PI    **Person-Months/Year:** 1.0

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**Title:** The Future of Airborne Radar (FY22): Synthetic Aperture Radar Imaging, Frequency-Agile Electronics, Distributed Radar Sensor Networks, and IMU Fusion for Position, Navigation, and Timing

**Sponsor:** Kansas City National Security Campus (KCNSC)

**PIs:** Jay McDaniel, Hjalti Sigmarsson, Mark Yeary, and Nathan Goodman

**Award Amount:** \$320,000    **Period of Performance:** 12/15/2021 – 12/14/2022

**Role:** PI    **Person-Months/Year:** 0.5

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**Title:** Numerical Modeling for Waveforms - Phase I

**Sponsor:** DEFENSEWERX

**PIs:** Justin Metcalf and Jay McDaniel

**Award Amount:** \$100,000    **Period of Performance:** 02/17/2022 – 10/31/2022

**Role:** Co-PI    **Person-Months/Year:** 0.5

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**Title:** OU Biotechnology Analysis and Collaboration  
**Sponsor:** DEFENSEWERX  
**PIs:** Justin Metcalf and Jay McDaniel  
**Award Amount:** \$25,000 **Period of Performance:** 01/27/2022 – 10/31/2022  
**Role:** Co-PI **Person-Months/Year:** 0.5

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**Title:** Revolutionary Radar - Miniaturized Airborne SAR Emulator  
**Sponsor:** Sandia National Laboratories  
**PIs:** Jay McDaniel, Hjalti Sigmarsson, Nathan Goodman, and Russell Kenney  
**Award Amount:** \$213,959 **Period of Performance:** 12/03/2020 – 09/30/2022  
**Role:** PI **Person-Months/Year:** 0.5

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**Title:** FY22: An Investigation of Through-Barrier Communications  
**Sponsor:** Sandia National Laboratories  
**PIs:** Jay McDaniel  
**Award Amount:** \$109,460 **Period of Performance:** 10/01/2021 – 09/30/2022  
**Role:** PI **Person-Months/Year:** 0.5

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**Title:** Radar Consortium FY21: Next Generation SAR, Frequency-Agile Electronics, and Fusion Techniques for Position, Navigation, and Timing  
**Sponsor:** Kansas City National Security Campus  
**PIs:** Jay McDaniel, Hjalti Sigmarsson, Mark Yeary, Nathan Goodman, and Caleb Fulton  
**Award Amount:** \$390,000 **Period of Performance:** 12/11/2020 – 12/31/2021  
**Role:** PI **Person-Months/Year:** 0.5

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**Title:** Radar Analysis and Novel Antenna Research  
**Sponsor:** U.S. Federal Government  
**PIs:** Jay McDaniel, Jessica Ruyle, Justin Metcalf, and Mark Yeary  
**Award Amount:** \$903,264 **Period of Performance:** 10/15/2019 – 08/28/2021  
**Role:** PI **Person-Months/Year:** 0.5

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**Title:** Radar Consortium FY20: Next Generation SAR Architectures and Integrated RF Technologies  
**Sponsor:** Kansas City National Security Campus  
**PIs:** Jay McDaniel, Hjalti Sigmarsson, Mark Yeary, Nathan Goodman, and Caleb Fulton  
**Award Amount:** \$290,000 **Period of Performance:** 12/11/2019 – 12/31/2020  
**Role:** PI **Person-Months/Year:** 1.0

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**Title:** Miniaturized SAR Hardware for Airborne Applications  
**Sponsor:** Sandia National Laboratories  
**PIs:** Jay McDaniel, Hjalti Sigmarsson, and Nathan Goodman  
**Award Amount:** \$110,719 **Period of Performance:** 04/15/2020 – 09/30/2020  
**Role:** PI **Person-Months/Year:** 0.5

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**Title:** Fine Resolution Position Estimation Using Multi-IMU Techniques

**Sponsor:** Sandia National Laboratories

**PIs:** Jay McDaniel

**Award Amount:** \$30,000    **Period of Performance:** 10/15/2019 – 09/30/2020

**Role:** PI                      **Person-Months/Year:** 0.5

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**Title:** Switched Octave Filter Bank

**Sponsor:** Parry Labs

**PIs:** Jay McDaniel, Hjalti Sigmarsson, and Shahrokh Saeedi

**Award Amount:** \$205,271    **Period of Performance:** 05/13/2019 – 11/30/2019

**Role:** PI                      **Person-Months/Year:** 1.0

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**Title:** Radar 2021 Consortium Grant Phase IV

**Sponsor:** Kansas City National Security Campus

**PIs:** Jay McDaniel, Hjalti Sigmarsson, Mark Yeary, Nathan Goodman, and Caleb Fulton

**Award Amount:** \$180,700    **Period of Performance:** 09/15/2018 – 09/14/2019

**Role:** PI                      **Person-Months/Year:** 1.0

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**Title:** Radar 2021 Consortium Grant Phase III

**Sponsor:** Kansas City National Security Campus

**PIs:** Hjalti Sigmarsson, Jay McDaniel, Mark Yeary, Nathan Goodman, and Caleb Fulton

**Award Amount:** \$165,000    **Period of Performance:** 09/15/2017 – 09/14/2018

**Role:** Co-PI                      **Person-Months/Year:** 0.0

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**Title:** Radar 2021 Consortium Grant Phase II

**Sponsor:** Kansas City National Security Campus

**PIs:** Hjalti Sigmarsson, Jay McDaniel, Mark Yeary, Nathan Goodman, and Caleb Fulton

**Award Amount:** \$150,000    **Period of Performance:** 09/15/2016 – 09/14/2017

**Role:** Co-PI                      **Person-Months/Year:** 0.0

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**Title:** Radar 2021 Consortium Grant Phase I

**Sponsor:** Kansas City National Security Campus

**PIs:** Jay McDaniel, Sean Garrison, Ambrose Wolf

**Award Amount:** \$1,200,000    **Period of Performance:** 09/15/2015 – 09/14/2016

**Role:** PI                      **Person-Months/Year:** 0.0

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## Thesis

- [1] **J. W. McDaniel**, “Design, Integration, and Miniaturization of a Multichannel Ultra-Wideband Snow Radar Receiver and Passive Microwave Components,” *Masters Thesis*. <https://www.crisis.ku.edu/sites/default/files/biblio/TechRpt161.pdf>, 2015.

## Dissertation

- [1] **J. W. McDaniel**, “Self-Packaged and Low-loss Suspended Integrated Stripline Filters for Next Generation Systems,” *Ph.D. Dissertation*. <https://shareok.org/handle/11244/301298>, 2018.

## Publications and Presentations

### *Journal Papers*

- R. H. Kenney, J. G. Metcalf, and **J. W. McDaniel**, “Wireless Distributed Frequency Syntonization and Phase Synchronization for Mobile Platforms in Cooperative Digital Radar Networks,” *IEEE Trans. on Radar Systems*, 2023. (in-preparation)
- R. E. Jarvis, R. G. Mattingly, J. de la Barrera, J. G. Metcalf, and **J. W. McDaniel**, “Application of Orthogonal Frequency-Division Multiplexing Waveforms in Highly Precise and Efficient Radar Cross Section Measurements,” *IEEE Trans. on Instrumentation and Measurement*, 2023. (in-preparation)
- R. E. Jarvis, J. G. Metcalf, and **J. W. McDaniel**, “The Impact of Electromagnetic Radiation Regulations on Biomedical Imaging Radar,” *IEEE Journal of Electromagnetics, RF and Microwaves in Medicine and Biology (J-ERM)*, 2023. (under review).
- R. H. Kenney, R. E. Jarvis, H. H. Sigmarsson, and **J. W. McDaniel**, “Efficient Time-Domain Tuning of Microwave Filters Using Concepts from the Unscented Kalman Filter,” *IEEE Trans. on Microwave Theory and Technologies*, Aug. 2023. (accepted w/ major modifications)
- B. Sun, M. B. Yearly, H. H. Sigmarsson, and **J. W. McDaniel**, “Reduced Navigation Error Using a Multi-sensor Fusion Technique and Its Application in Synthetic Aperture Radar Imaging,” *IEEE Journal of Microwaves*, Aug. 2023. (accepted w/ minor modifications)
- R. H. Kenney and **J. W. McDaniel**, “Cooperative Navigation of Mobile Radar Sensors Using Time-of-Arrival Measurements and the Unscented Kalman Filter,” *IEEE Trans. on Radar Systems*, Aug. 2023. (accepted)
- S. D. Blunt *et al.*, “From the EiC: The IEEE Radar Journal is Born,” *IEEE Trans. on Radar Systems*, vol. 1, pp. 279-279, Aug. 2023.
- E. W. Wells, H. H. Sigmarsson, and **J. W. McDaniel**, “A Surface-Mountable Suspended Integrated Strip-Line Technology Using Castellated Vias,” *IEEE Trans. on Components, Packaging, and Manufacturing Technology*, vol. 13, no. 7, pp. 1067-1069, July 2023.
- J. M. Knowles, H. H. Sigmarsson, and **J. W. McDaniel**, “Generalized Theory and Realization of Continuously Loss-Programmable Bandpass Filtering Attenuators,” *IEEE Trans. on Microwave Theory and Technologies*, June 2023. (accepted)
- K. J. Kanaly, S. F. Bass, R. E. Jarvis, **J. W. McDaniel**, K. C. Kerby-Patel, and J. E. Ruyle, “Calibrated Cross-Frequency Backscatter Measurement of Antennas with Time-Varying Loads,” *IEEE Antennas and Wireless Propagation Letters*, vol. 22, no. 5, pp. 985-989, May 2023.
- C. Silva, A. A. Wael, **J. W. McDaniel**, and N. Pohl, “TC-24 Microwave/mm-Wave Radar, Sensing, and Array Systems Committee–2022,” *IEEE Microwave Magazine*, vol. 23, no. 11, pp. 126-127, Oct. 2022.

- R. E. Jarvis, J. G. Metcalf, and **J. W. McDaniel**, “Adaptive Pulse Compression and Its Application in Radar Cross Section Measurements,” *IEEE Trans. on Instrumentation and Measurement*, vol. 71, pp. 1-8, Oct. 2022.
- R. E. Jarvis and **J. W. McDaniel**, “Methodology and Techniques for Highly-Precise Radar Cross Section Measurements at W-Band,” *IEEE Access*, vol. 10, pp. 86744-86749, Aug. 2022.
- R. H. Kenney, J. L. Salazar-Cerreno, and **J. W. McDaniel**, “Two-Dimensional Beam Pattern Synthesis for Phased Arrays with Arbitrary Element Geometry via Magnitude Least Squares Optimization,” *IEEE Journal of Microwaves*, vol. 2, no. 2, pp. 337-346, Apr. 2022.
- R. E. Jarvis, J. G. Metcalf, J. E. Ruyle, and **J. W. McDaniel**, “Wideband Measurement Techniques for Extracting Accurate RCS of Single and Distributed Targets,” *IEEE Trans. on Instrumentation and Measurement*, vol. 71, pp. 1-12, Feb. 2022.
- B. Sun, R. H. Kenney, M. B. Yeary, H. H. Sigmarsson, and **J. W. McDaniel**, “An Up-Sampled Particle Filter Fusion Technique and Its Application in Synthetic Aperture Radar Imaging,” *IEEE Journal of Microwaves*, vol. 2, no. 1, pp. 108-122, Nov. 2021.
- R. E. Jarvis, R. G. Mattingly, and **J. W. McDaniel**, “UHF-Band Radar Cross Section Measurements Using Single Antenna Reflection Coefficient Results,” *IEEE Trans. on Instrumentation and Measurement*, vol. 70, pp. 1-4, Aug. 2021.
- R. H. Kenney, C. Walker, H. H. Sigmarsson, and **J. W. McDaniel**, “A Varactor-Based Tunable Compline Bandpass Filter Using Suspended Integrated Stripline (SISL),” *IEEE Journal on Miniaturization for Air and Space Systems*, vol. 2, no. 3, pp. 112-116, Oct. 2020.
- C. Walker, H. H. Sigmarsson, and **J. W. McDaniel**, “Design of a Wideband Surface Mountable Suspended Integrated Strip-line Technology,” *IEEE Access*, vol. 8, pp. 188825-188832, Oct. 2020.
- F. R. Morales, C. Leuschen, J. Paden, C. Carabajal, A. Wolf, and S. Garrison, and **J. W. McDaniel**, “An Improved UWB Microwave Radar for Very Long-Range Measurements of Snow Cover,” *IEEE Transactions on Instrumentation and Measurement*, vol. 69, no. 10, pp. 7761-7772, Oct. 2020.
- F. R. Morales, **J. W. McDaniel**, C. Carabajal, C. Leuschen, A. Wolf, and S. Garrison, “Prototyping an UWB Airborne Radar for Snow Probing Using Modular Building Blocks,” *Microwave Journal*, vol. 62, no. 9, pp. 78-90, Sept. 2019.
- J. W. McDaniel** and H. H. Sigmarsson, “Low Loss and Ultra-wide Passband Highpass Filter Using Suspended Integrated Strip-line Technology,” *IET Electronic Letters.*, vol. 55, no. 14, pp. 803-805, July 2019.
- J. W. McDaniel**, J. B. Yan, and S. Gogineni, “Super-wideband Cascaded Bandpass Filter Using Suspended Substrate Stripline Technology,” *Wiley Microwave and Optical Technology Letters*, vol. 61, no. 6, pp. 1491-1499, Apr. 2019.

- J. W. McDaniel**, S. Saeedi, M. B. Yearly, and H. H. Sigmarsson, “A Low Loss Fully-Board Integrated Low Pass Filter Using Suspended Integrated Strip-line Technology,” *IEEE Trans. on Compon. Packag. Manuf. Technol.*, vol. 8, no. 11, pp. 1948-1955, Nov. 2018.
- J. W. McDaniel**, M. B. Yearly, H. H. Sigmarsson, J. A. Wolf, S. Garrison, K. Byers, and M. Clewell, “Integration and Miniaturization of a Ka-Band Stepped Frequency Radar for UAV Applications,” *Advancing Microelectronics*, vol. 45, no. 2, pp. 6-10, Mar. 2018. (invited).
- J. B. Yan, **J. W. McDaniel**, D. Gomez, Y. Li, and S. Gogineni, “Ultra-Wideband FMCW Radar for Airborne Measurements of Snow Over Sea-ice and Land,” *IEEE Trans. Geosci. Remote Sens.*, vol. 55, no. 2, pp. 834-843, Feb. 2017.
- J. W. McDaniel**, J. B. Yan, and S. Gogineni, “Design, Integration, and Miniaturization of a Multi-channel Ultrawide-band (UWB) Snow Radar Receiver for Airborne Remote Sensing,” *Microwave Journal*. vol. 59, no. 4, pp. 20-28, Apr. 2016.

### **Conference Papers**

#### **Full Paper:**

- R. H. Kenney and **J. W. McDaniel**, “Simultaneous Time, Frequency, and Phase Synchronization for Coherent Distributed All-Digital Phased Array Systems,” *2023 International Radar Conference*, Sydney, Australia, 2023. (submitted)
- R. E. Jarvis and **J. W. McDaniel**, “An Investigation of Multi-Path Electromagnetic Wave Propagation in Biological Tissue Stack-Ups,” *2023 International Microwave Biomedical Conference (IMBioC)*, Leuven, Belgium, 2023. (accepted)
- J. M. Knowles, H. H. Sigmarsson, and **J. W. McDaniel**, “Higher-Order Filtenuator Generalization and Filter Shape Optimization,” in *Proceedings of 2023 IEEE Wireless and Microwave Technology Conference (WAMICON)*, Melbourne, FL, 2023.
- B. D. Carlton, **J. W. McDaniel**, and J. G. Metcalf, “Optimizing the Tradeoff Between Radar Waveform Resolution and Sidelobe Level Using a Dolph-Chebyshev Approach,” in *Proceedings of 2023 IEEE Radar Conference (RadarConf)*, San Antonio, TX, 2023. (accepted)
- E. W. Wells, H. H. Sigmarsson, and **J. W. McDaniel**, “Design of a Frequency-Agile and Surface Mountable Suspended Integrated Strip-Line Bandpass Filter Using Castellated Vias,” in *Proceedings of 2022 IEEE Wireless and Microwave Technology Conference (WAMICON)*, Clearwater Beach, FL, 2022.
- J. M. Knowles, H. H. Sigmarsson, and **J. W. McDaniel**, “Design of a Symmetric Lumped-Element Bandpass Filtering Attenuator (Filtenuator),” in *Proceedings of 2022 IEEE Wireless and Microwave Technology Conference (WAMICON)*, Clearwater Beach, FL, 2022.
- C. Fulton, N. Goodman, M. Yearly, B. Palmer, H. H. Sigmarsson, and **J. W. McDaniel**, “Preliminary System Integration and Performance Features for an S-Band, Dual-Polarized, All-Digital

- Phased Array Radar,” in *Proceedings of 2022 IEEE International Microwave Symposium (IMS)*, Denver, CO, 2022.
- J. L. Salazar, D. Schwartzman, D. Bodine, R. Palmer, **J. W. McDaniel**, M. Yeary, N. Aboserwal, B. Cheong, and T. Yu, “A Dual-Doppler Ka-Band Mobile Radar Architecture with Rapid-Scanning Volumetric Imaging for Earth Systems Science,” in *Proceedings of 2022 IEEE Radar Conference (RadarConf)*, Times Square, New York, 2022.
- R. E. Jarvis, J. G. Metcalf, J. E. Ruyle, and **J. W. McDaniel**, “High Temporal Resolution Time-Gating for Wideband Radar Cross Section Measurements,” in *Proceedings of European Microwave Week*, London, UK, 2021.
- R. E. Jarvis, J. G. Metcalf, J. E. Ruyle, and **J. W. McDaniel**, “Measurement and Signal Processing Techniques for Extracting Highly Accurate and Wideband RCS,” in *Proceedings of 2021 IEEE International Instrumentation and Measurement Technology Conference (I2MTC)*, Glasgow, Scotland, May 2021.
- R. H. Kenney, K. Konyalioglu, M. B. Yeary, H. H. Sigmarsson, and **J. W. McDaniel**, “An All-COTS High Sampling Frequency Pulse-Doppler Imaging Radar,” in *Proceedings of 2020 IEEE Radar Conference (RadarConf)*, Florence, Italy, Sept. 2020.
- B. Sun, M. B. Yeary, H. H. Sigmarsson, and **J. W. McDaniel**, “A New Multi-Particle Filter Sensor Fusion Technique Based on Sequential Importance Re-sampling,” in *Proceedings of 2020 IEEE International Instrumentation and Measurement Technology Conference (I2MTC)*, Dubrovnik, HR, May 2020.
- J. G. Metcalf, **J. W. McDaniel**, J. E. Ruyle, N. A. Goodman, and J. C. Borders, “An Examination of Frequency-Modulated Continuous Wave Radar for Biomedical Imaging,” in *Proceedings of 2020 IEEE Radar Conference (RadarConf)*, Washington, D.C., Apr. 2020.
- A. M. Palmer, N. L. Bohannon, **J. W. McDaniel**, K. C. Kerby-Patel, and J. E. Ruyle “Investigation of Varactor Loaded Slot Antenna for Parametric Mixing,” in *Proceedings of 2019 Antenna Applications Symposium*, Allerton Park, Monticello, IL, 2019.
- B. Sun, M. B. Yeary, H. H. Sigmarsson, and **J. W. McDaniel**, “Fine Resolution Estimation Using Kalman Filtering,” in *Proceedings of 2019 IEEE International Instrumentation and Measurement Technology Conference (I2MTC)*, Auckland, NZ, May 2019.
- J. W. McDaniel**, “Simulation Guidelines for Wideband Ground Backed Coplanar Waveguide Transmission Lines,” in *Proceedings of 2019 IEEE Wireless and Microwave Technology Conference (WAMICON)*, Cocoa Beach, FL, Apr. 2019.
- R. H. Kenney, M. B. Yeary, H. H. Sigmarsson, and **J. W. McDaniel**, “Clock-Incoherence in All-Digital Radar Back-Ends,” in *Proceedings of 2019 Government Microcircuit Applications and Critical Technology Conference (GOMACTech)*, Albuquerque, NM, Mar. 2019.

**J. W. McDaniel**, S. Saeedi, M. B. Yearly, and H. H. Sigmarsson, “A Ka-band Suspended Integrated Strip-line Transition and Low Pass Filter Design,” in *Proceedings of 2018 Government Microcircuit Applications and Critical Technology Conference (GOMACTech)*, Miami, FL, Mar. 2018.

**J. W. McDaniel**, H. H. Sigmarsson, M. B. Yearly, F. R. Morales, C. Leuschen, A. Feathers, “Ultrawideband Frequency Modulated Continuous Wave Radar and Ku-Band Synthetic Aperture Radar for Airborne Imaging and Snow Characterization,” in *Proceedings of 2017 International Symposium on Earth-Science Challenges (ISEC)*, Uji, Kyoto, Japan, Oct. 2017.

F. R. Morales, C. Leuschen, A. Feathers, **J. W. McDaniel**, J. A. Wolf, and S. Garrison, “Packaging and Miniaturization of a 2-18 GHz UWB Radar for Measurements of Snow and Ice: Initial Results,” in *Proceedings of 2017 International Microelectronics Assembly and Packaging Conference (IMAPS)*, Raleigh, NC, Oct. 2017.

**J. W. McDaniel**, M. B. Yearly, H. H. Sigmarsson, J. A. Wolf, S. Garrison, K. Byers, and M. Clewell, “Integration and Miniaturization of a Ka-Band Stepped Frequency Radar for UAV Applications,” in *Proceedings of 2017 International Microelectronics Assembly and Packaging Conference (IMAPS)*, Raleigh, NC, Oct. 2017.

**J. W. McDaniel**, S. Saeedi, M. B. Yearly, and H. H. Sigmarsson, “Suspended Integrated Strip-line Transition Design for Highly Integrated Radar Systems,” in *Proceedings of 2017 Government Microcircuit Applications and Critical Technology Conference (GOMACTech)*, Reno, NV, Mar. 2017.

J. B. Yan, **J. W. McDaniel**, D. Gomez, Y. Li, and S. Gogineni, “Multi-channel Ultra-Wideband Airborne Radar for Snow Back-scattering Measurements,” in *Proceedings of 2016 IEEE International Symposium on Phased Array Systems and Technology (PAST)*, Waltham, MA, Oct. 2016.

J. B. Yan, **J. W. McDaniel**, D. Gomez, Y. Li, C. Leuschen, S. Gogineni, and J. Brozena, “Ultra-wideband 2-18 GHz FMCW Radar with 1.4-cm Range Resolution for Airborne Measurement of Snow,” *Snow Thickness on Sea Ice Working Group (STOSIWIG)*, Irvine, CA, 2015. (invited).

### **Patents:**

**J. W. McDaniel**, M. B. Yearly, H. H. Sigmarsson, and B. Sun, “Multi-Inertial Measurement Unit Fusion for Fine Resolution Position Estimation,” U.S. Patent 11,435,485, issued Sept. 6, 2022.

**J. W. McDaniel**, J. G. Metcalf, and R. E. Jarvis, “Application of Adaptive Pulse Compression (APC) in Cluttered Radar Cross-Section (RCS) Measurements,” U.S. Patent and Trademark Office, Provisional Patent 63/379,553, submitted Oct. 14, 2022.

### **Case Study:**

**J. W. McDaniel**, “Inspiring the Next Generation of RF Engineers,” *Featured Tektronix Case Study*, Tektronix, Fall 2020.



### **Abstracts:**

- J. Salazar-Cerreno, D. Bodine, R. D. Palmer, D. Schwartzman, **J.W. McDaniel**, P. E. Kirtsetter, C.R. Homeyer, B. Cheong, T. Y. Yu, M. Yeary, and P. Kollias, “Advancing Atmospheric Science with a State-of-the-Art mm-Wave Phased Array Radar Technology,” *40th Conference on Radar Meteorological*, Minneapolis, MN, Aug. 2023.
- J. Salazar-Cerreno, D. Bodine, R. D. Palmer, D. Schwartzman, **J.W. McDaniel**, P. E. Kirtsetter, C.R. Homeyer, B. Cheong, T. Y. Yu, M. Yeary, and P. Kollias, “The Impact of mm-Wave Fast Scanning Phased Array Radar for Atmospheric Science,” *14th International Precipitation Conference*, Norman, OK, June 2023.
- J. Salazar-Cerreno, R.D. Palmer, D. Bodine, **J.W. McDaniel**, C.R. Homeyer, et. al, “Dual-Doppler 3D Mobile Ka-band Rapid-Scanning Volume Imaging Radar for Earth System Science,” *102nd American Meteorological Society Annual Meeting*, Houston, TX, Jan. 2022.
- R.D. Palmer, **J. W. McDaniel**, et. al, “Transportable Phased Array Radar: Meeting Weather Community Needs,” *102nd American Meteorological Society Annual Meeting*, Houston, TX, Jan. 2022.
- R.D. Palmer, **J. W. McDaniel**, et. al, “The Transportable Phased Array Radar: Meeting Community Imperatives in Weather Science,” *AGU Fall Meeting*, New Orleans, LA, Dec. 2021.
- J. Salazar, D. J. Bodine, **J. W. McDaniel**, C. R. Homeyer, R. D. Palmer, et. al, “A New Ka-Band Image PAR Concept for 4D-Volume Rapid Scan for Cloud Observations,” *100th American Meteorological Society Annual Meeting*, Boston, MA, Jan. 2020.
- D. J. Bodine, J. Salazar, **J. W. McDaniel**, C. R. Homeyer, R. D. Palmer, et. al, “Next-Generation Cloud Radars: How Do We Obtain Rapid Three-Dimensional Observation of Clouds?,” *100th American Meteorological Society Annual Meeting*, Boston, MA, Jan. 2020.
- D. J. Bodine, J. Salazar, **J. W. McDaniel**, C. R. Homeyer, R. D. Palmer, et. al, “Next-generation cloud radars: Applications of rapid-scan cloud radars for three-dimensional mapping of clouds,” *AGU Fall Meeting*, San Francisco, CA, Dec. 2019.
- P. E. Kirtsetter, R. D. Palmer, D. J. Bodine, C. R. Homeyer, T. Y. Yu, **J. W. McDaniel**, et. al, “Stratospheric Radar Observations of Convection and Precipitation,” *AGU Fall Meeting*, San Francisco, CA, Dec. 2019.
- A. M. Palmer, **J. W. McDaniel**, N. L. Bohannon, and J. E. Ruyle “Investigation of Varactor Loaded Slot Antenna for Parametric Mixing,” *CAPCON XIV*, VA, May 2019.

### **Presentations**

- J. W. McDaniel** and R. E. Jarvis, “Fusion-Based State Estimation for Localization and Synchronization of Distributed Radar Sensor Networks,” *Invited: Office of Naval Research DNI Meeting*, Office of Naval Research, August 2023.

- J. W. McDaniel** and R. E. Jarvis, “Advancements in Radar Science Through the DOE’s Radar Consortium,” *Invited: National Security Campus Cross-Consortium Meeting*, Kansas City National Security Campus, June 2023.
- J. W. McDaniel** and R. E. Jarvis, “Advancements in Wideband, Cluttered, and Real Time Radar Cross Section Measurements,” *Invited: Lt. Gen. Hawkins, AFSC Commander, Event Briefing*, Tinker Air Force Base, Apr. 2023.
- J. W. McDaniel**, “Airborne Synthetic Aperture Radar: Low C-SWaP Position, Navigation and Timing Solutions, OU System Flight Tests, mmWave SAR, and Distributed Coherent Radar Concepts,” *Invited: Jet Propulsion Laboratories Radar Science and Engineering Lecture*, JPL, Nov. 2022.
- J. W. McDaniel**, “The Future of Airborne Radar: High Performance and Low-SWaP Components and Systems for Advanced Radar Applications,” *Invited: NNSA Cross-Consortia Research Presentation*, KCNSC, July 2022.
- J. W. McDaniel**, “Novel Multi-INS Fusion for Fine Resolution Position Estimation,” *Invited Seminar*, KCNSC, July 2019.
- J. W. McDaniel**, “Overview of OU ARRC Radar Program and Next Generation RF/Microwave Component and System Designs for Airborne and Spaceborne Applications,” *Invited Seminar, NASA Marshall Space Flight Center*, NASA, April 2019.
- J. W. McDaniel**, “Novel Multi-INS Fusion for Fine Resolution Position Estimation,” *Invited Seminar*, SNL, March 2019.
- J. W. McDaniel**, “Overview of OU ARRC Radar Program and Next Generation RF/Microwave Component and System Designs for Airborne and Spaceborne Applications,” *Invited Seminar, NASA Goddard Space Flight Center*, NASA, March 2019.
- J. W. McDaniel**, “Overview of OU ARRC Radar Program and RF/Microwave Design Activities,” *Invited Seminar, U.S. Naval Research Laboratory, NRL*, October 2018.
- J. W. McDaniel**, “Design and Development of a Ku-band Synthetic Aperture Radar and Novel Microwave Components,” *Invited, Advanced Radar Research Center’s Industry and Government Days*, University of Oklahoma, November 2017.
- J. W. McDaniel**, “Design and Development of a Ku-band Synthetic Aperture Radar and Novel Microwave Components,” *Invited, Bi-Annual Advisory Board Meeting*, University of Oklahoma, November 2017.
- J. W. McDaniel**, “Frequency Scaling of Suspended Integrated Strip-line Filter Technology for Highly Integrated Microwave Transceivers up to Ka-band,” *Kansas City National Security Campus Update*, KCNSC, Summer 2017.

- J. W. McDaniel**, “Design of a Novel Suspended Integrated Strip-line Filter Technology for Highly Integrated Microwave Transceivers,” *Kansas City National Security Campus Update*, KCNSC, Spring 2017.
- J. W. McDaniel**, “Design and Development of a Ku-band Synthetic Aperture Radar and Microwave Components for UAV Imaging,” *Oklahoma Research Day*, University of Oklahoma, Spring 2017.
- J. W. McDaniel**, “Suspended Integrated Strip-line Transition for Highly Integrated Radars Systems,” *GOMACTech 2017*, Reno, NV, March, 2017.
- J. W. McDaniel**, “Design and Integration of a Ku-band SAR Imaging Radar,” *Kansas City National Security Campus Update*, KCNSC, Summer 2016.
- J. W. McDaniel**, “Design and Integration of a 2-18 GHz FMCW Snow Radar and Passive Microwave Components,” *National Science Foundation*, Arlington, VA, Spring 2015.
- J. W. McDaniel**, “Design and Integration of a 2-18 GHz FMCW Snow Radar,” *Naval Research Laboratory Research Update*, University of Kansas, Spring 2015.
- J. W. McDaniel**, “Importance of Higher Education and Innovative Research,” *Invited Talk, Self Fellow Summer Program*, University of Kansas, June 2014.
- J. W. McDaniel**, “Design and Integration of a 2-18 GHz FMCW Snow Radar,” *Naval Research Laboratory Research Update*, University of Kansas, Spring 2014.
- J. W. McDaniel**, “The Decision Making Process for Graduate School vs. Industry,” *Invited Talk, IEEE HKN Lecture Series*, Kansas State University, March 2014.

## Courses Taught

<i>ECE 3613: Electromagnetic Fields I</i>	Fall 2023
<i>ECE 4973/5973: RF &amp; Microwave Circuits: An Electromagnetics Approach</i>	Spring 2023
<i>ECE 4703/5703: Electromagnetic Fields and Wave Propagation II</i>	Fall 2022
<i>ECE 3613: Electromagnetic Fields I</i>	Fall 2021
<i>ECE 4973/5973: RF &amp; Microwave Circuits: An Electromagnetics Approach</i>	Spring 2021
<i>ECE 4703/5703: Electromagnetic Fields and Wave Propagation II</i>	Fall 2020
<i>ECE 4973/5973: RF &amp; Microwave Circuits: An Electromagnetics Approach</i>	Spring 2020
<i>ECE 3613: Electromagnetic Fields I</i>	Fall 2019
<i>ECE 4703/5703: Electromagnetic Fields and Wave Propagation II</i>	Fall 2018

## Students Mentored or Advised

### *Current*

#### **Undergraduate:**

Cody Kieu: Undergraduate Research Assistant Summer 2023 – Present

#### **Masters:**

Bradlee Harrison: Master's Member Summer 2023 – Present

**Alex Adkisson: Master's Committee Chair Summer 2023 – Present**

Amilton Pensamento: Master's Committee Member Spring 2023 – Present

**Andrew Gonzales: Master's Committee Chair Summer 2022 – Present**

#### **Ph.D.:**

**Jorge Alva: Doctoral Committee Chair Summer 2023 – Present**

**Rishabh Ashok Sanghai: Doctoral Committee Chair Summer 2023 – Present**

**Cora DeFrancesco: Master's Committee Chair Spring 2023 – Present**

*National Science Foundation Graduate Research Fellow*

Randall Summers: Doctoral Committee Member Fall 2022 – Present

**Brian Carlton: Doctoral Committee Co-Chair Fall 2022 – Present**

**Jon Knowles: Doctoral Committee Chair Summer 2022 – Present**

*DoD National Defense Science and Engineering Graduate Fellow*

Rylee Mattingly: Doctoral Committee Member Fall 2021 – Present

**Rachel Jarvis: Doctoral Committee Chair Summer 2021 – Present**

*National Science Foundation Graduate Research Fellow*

**Russell Kenney: Doctoral Committee Chair Summer 2020 – Present**

*DoD National Defense Science and Engineering Graduate Fellow*

Syed Shahan Jehangir: Doctoral Committee Member Spring 2020 – Present

Alexander Moreno: Doctoral Committee Member Fall 2019 – Present

### *Graduated (or otherwise completed)*

#### **Undergraduate:**

Alex Adkisson

Employment: Undergraduate Research Assistant, Spring 2023

Affiliation: University of Oklahoma (Masters Program)

Joseph LaSala

Employment: Undergraduate Research Assistant, Spring 2023

Affiliation: University of Oklahoma (Masters Program)

Cora DeFrancesco

Employment: Undergraduate Research Assistant, Fall 2022

Affiliation: University of Oklahoma (Ph.D. Program)

Andrew Gonzales

Position: Undergraduate Research Assistant, Spring 2022  
Employment: University of Oklahoma (Masters Program)  
Thesis: Design of a Volumetric Synthetic Aperture Radar Demonstrator

Rylee Mattingly

Position: Summer Graduate Research Assistant, Summer 2020  
Employment: University of Oklahoma (PhD Program)  
Thesis: Automation of a Broadband Radar Cross Section Test Setup

Mohammad Alwahdane

Position: Undergraduate Research Assistant, Spring 2021  
Employment: TESLA

Eric Wells

Position: Undergraduate Research Assistant, Spring 2021  
Employment: University of Oklahoma (Masters Program)

Nicole Palmer

Position: Undergraduate Research Assistant, Spring 2021  
Employment: L3-Harris

Jonathan Knowles

Position: Undergraduate Research Assistant, Fall 2020  
Employment: University of Oklahoma (Masters Program)

Amanda Garcia

Position: Undergraduate Research Assistant, Spring 2020  
Employment: Valero

Grant Karber

Position: Undergraduate Research Assistant, Spring 2020  
Employment: University of Oklahoma (Masters Program)  
Thesis (Honors): Analysis of DGS in Suspended Integrated Stripline (SISL) Cavities

Rachel Jarvis

Position: Undergraduate Research Assistant, Fall 2019 – Spring 2020  
Employment: University of Oklahoma (Masters Program)  
Thesis (Honors): Broadband RF Backscatter Measurements with Multi-path Clutter Cancellation for Enhanced Chamber Dynamic Range Capabilities

Darren Midkiff

Position: Undergraduate Honors Research, Fall 2019  
Undergraduate Research Assistant, Fall 2018 – Spring 2019

Employment: University of Colorado, Boulder (Masters Program)  
Thesis (Honors): FPGA Multi-Capture Firmware for Synthetic Aperture Radar

Joseph Tullius

Position: Undergraduate Research Assistant, Spring 2019 – Fall 2019  
Employment: Garmin International - Analog RF Engineer  
Thesis: Multi-layer Via Modeling for High Frequency Low Loss Transitions

Heath Vann

Position: Undergraduate Research Assistant, Spring 2019  
Employment: University of Oklahoma, Norman (Masters Program)  
Thesis: 3D-Printable 2-18 GHz Vivaldi Tapered Horn Antenna Design

Russell Kenney

Position: Undergraduate Honors Research, Fall 2018  
Undergraduate Research Assistant, Fall 2018 – Spring 2019  
Employment: University of Oklahoma, Norman (Masters Program)  
Thesis (Honors): Clock Incoherence Correction in All-Digital Radar Back-Ends

Christopher Walker

Position: Undergraduate Research Assistant, Summer 2018  
Employment: University of Oklahoma, Norman (Masters Program)

#### **Masters:**

Rosalind Agasti

Role: Masters Thesis Committee Member, Fall 2022 – Spring 2023  
Employment: University of Oklahoma (PhD Program)  
Thesis: Frequency-Agile Filtering Antennas for S-band and X-band Applications

Chaise Glenn

Role: Masters Thesis Committee Member, Fall 2022 – Spring 2023  
Employment: L3-Harris  
Thesis: Signal Processing Techniques for Radar Cross Section Measurements Using Orthogonal Frequency-Division Multiplexing Waveforms

Kurt Konyalioglu

Role: Masters Thesis Committee Chair, Fall 2019 – Spring 2022  
Employment: University of Oklahoma (Advanced Radar Research Center)  
Thesis: Design and Integration of a Low Cost, Size, Weight, and Power Vertical-Pointing Synthetic Aperture Radar

Jon Knowles

Role: Masters Thesis Committee Chair, Spring 2021 – Spring 2022  
Employment: University of Oklahoma (PhD Program)

Thesis: Design and Implementation of a Loss-Programmable Filtering Attenuator

Eric Wells  
 Role: Masters Thesis Committee Chair, Fall 2021 – Spring 2022  
 Employment: Northrup Grumman  
 Thesis: Design and Fabrication of a Frequency-Agile and Surface Mountable Suspended Integrated Stripline (SISL) Bandpass Filter

Kyle Kanaly  
 Role: Masters Thesis Committee Member, Summer 2020 – Fall 2021  
 Employment: Electronic Warfare Associates (EWA)  
 Thesis: Design and Validation of Measurement Procedures for Time-Varying Scatterers and Antennas

Randall Summers  
 Role: Masters Thesis Committee Member, Fall 2020 – Fall 2021  
 Employment: University of Oklahoma (PhD Program)  
 Thesis: Digital Predistortion of Wideband Radar Waveforms

Savannah Pate  
 Role: Masters Thesis Committee Member, Fall 2020 – Summer 2021  
 Employment: Raytheon  
 Thesis: Predictive Tracking Simulation and Techniques for All-Digital Radar

Paul Hartline  
 Role: Masters Thesis Committee Chair, Summer 2019 – Summer 2021  
 Employment: Sandia National Laboratories  
 Thesis: Design and Implementation of a High Power, High Temperature, and Surface Mountable 2-4 GHz Circulator for Integrated RF Transceivers

Grant Karber  
 Role: Masters Thesis Committee Chair, Fall 2020 – Summer 2021  
 Employment: Skydweller Aero  
 Thesis: Spurious Suppression Techniques in Integrated and Embedded Microwave Components

Rachel Jarvis  
 Role: Masters Thesis Committee Chair, Fall 2020 – Spring 2021  
 Employment: University of Oklahoma (PhD program)  
 Thesis: Calibration and Clutter Cancellation Techniques for Accurate and Wideband Radar Cross Section Measurements

Alex Pham  
 Role: Masters Thesis Committee Member, Fall 2020 – Spring 2021

Employment: L3-Harris  
Thesis: Reconfigurable Filter Design Using Liquid Metal Actuation

Paul Boydstun

Role: Masters Thesis Committee Member, Fall 2018 – Fall 2020  
Employment: TBD  
Thesis: Quasi-Omnidirectional Broadband Anti-Reflective Surface of Multi-Level Sub-Wavelength Structures

Russell Kenney

Role: Masters Thesis Committee Chair, Fall 2019 – Spring 2020  
Employment: University of Oklahoma (PhD Program)  
Thesis: Design and Implementation of an All-COTS Digital Back-end for a Pulse-Doppler Synthetic Aperture Radar

Callin Schone

Role: Masters Thesis Committee Member, Fall 2019 – Spring 2020  
Employment: L3-Harris  
Thesis: SAR Image Formation Via Subapertures and 2D Backprojection

Ashley Palmer

Role: Masters Thesis Committee Member, Fall 2018 – Fall 2019  
Employment: L3-Harris  
Thesis: Investigation of a Generalized Frequency Domain Method for Modeling Time-Varying Loads on Antennas

Christopher Walker

Role: Masters Thesis Committee Chair, Fall 2018 – Fall 2019  
Employment: L3-Harris  
Thesis: Design of a Circularly Polarized Rectifying Antenna on a Flexible Substrate at X-Band

Eivy Arroyo Diaz

Role: Masters Thesis Committee Member, Fall 2018 – Spring 2019  
Employment: Northrop Grumman  
Thesis: Highly Miniaturized VHF Helical Filters with Fully Reconfigurable Capabilities

**Ph.D.:**

Dr. Brian Sun

Role: Doctoral Committee Chair, Fall 2018 – Spring 2022  
Employment: University of Oklahoma (ARRC Research Scientist)  
Thesis: Fusion of Multiple Inertial Measurement Units and Its Application in Reduced Cost, Size, Weight, and Power Synthetic Aperture Radars



Dr. Stephen Bass

Role: Doctoral Committee Member, Fall 2019 – Fall 2021  
Employment: IC Post-Doctoral Program (University of Illinois - Urbana Champagne)  
Thesis: Non-Linear Time Invariant Antenna Design and Modeling Techniques

Dr. Siddhant Gupta

Role: Doctoral Committee Member, Spring 2021 – Fall 2021  
Employment: Brookhaven National Laboratory  
Thesis: In-Situ and Satellite-Based Estimates of Aerosol-Cloud Interactions  
Between Biomass Burning Aerosols and Marine Stratocumulus Clouds over  
the Southeast Atlantic Ocean

Dr. Nicholas Peccarelli

Role: Doctoral Committee Member, Fall 2018 – Spring 2020  
Employment: Amazon (Project Kuiper)  
Thesis: Non-Linear Equalization and Digital Pre-Distortion Techniques for Future  
Radar and Communications Digital Array Systems