

Jonathan R. Skuza

CONTACT INFORMATION Department of Physics & Astronomy Phone: (734) 487-8797
Eastern Michigan University
240 Strong Hall Email: jskuza@emich.edu
Ypsilanti, MI 48197 USA

CITIZENSHIP USA

PROFESSIONAL APPOINTMENTS **Eastern Michigan University**, Ypsilanti, Michigan USA
Assistant Professor August 2016 to Present

Norfolk State University, Norfolk, Virginia USA
Research Associate Professor April 2013 to July 2016

National Institute of Aerospace, Hampton, Virginia USA
Research Scientist II February 2013 to April 2013
Research Scholar February 2011 to February 2013

EDUCATION **The College of William & Mary**, Williamsburg, Virginia USA
Ph.D., Physics (2011)

The University of Toledo, Toledo, Ohio USA
M.S., Physics (2007)

Baldwin-Wallace University, Berea, Ohio USA
B.S., Physics (2004)

TEACHING EXPERIENCE **Eastern Michigan University**, Ypsilanti, Michigan USA
Department of Physics & Astronomy
ASTR 105 *Exploration of the Universe* (Fall 2017-2018, Winter 2018-2019)
PSCI 110 *Science of Everyday Life* (Winter 2018)
PHY 221 *Mechanics, Sound, & Heat* (Winter 2017, 2020, & 2021, Fall 2020)
PHY 222 *Electricity & Light* (Summer 2018-2021, Fall 2020)
PHY 223 *Mechanics & Sound* (Winter 2017, 2019, & 2020)
PHY 370 *Introduction to Modern Physics* (Fall 2016-2021)
PHY 372 *Modern Physics Laboratory* (Fall 2016-2019 & 2021, Winter 2020-2021)
PHY 664 *Advanced Mechanics I* (Winter 2018, Fall 2019 & 2021)
PHY 671 *Electromagnetic Theory* (Winter 2019 & 2021)

Norfolk State University, Norfolk, Virginia USA

Department of Engineering

OEN 201 *Physical & Instrumental Optics II* (Spring 2015)

OEN 380 *Introduction to Quantum Optics* (Fall 2015)

Center for Materials Research

MSE 600 *Research Seminar I* (Fall 2014)

MSE 601 *Research Seminar II* (Spring 2014)

MSE 605 *Ethics for Scientific Conduct* (Fall 2013 & 2014)

The University of Toledo, Toledo, Ohio USA

Department of Physics & Astronomy

PHYS 2080 *Algebra-based electromagnetism laboratory* (Spring 2005)

PHYS 2140 *Calculus-based electromagnetism laboratories* (Fall 2004)

PHYS 3180 *Advanced Electronics laboratory* (Spring 2005)

RESEARCH
INTERESTS

Epitaxial and multilayered thin-film and nanostructure growth; structure-property correlations in thin films and nanostructures; smart optical materials; plasmonics; transition metal oxides; metal-insulator transitions; high magnetic anisotropy materials; spintronics; high- κ dielectrics; wide bandgap semiconductors

TECHNICAL
EXPERTISE

Ultra-high vacuum (UHV) technology and deposition systems; epitaxial thin film deposition methods (*e.g.*, DC/pulsed DC and RF sputtering, thermal and e-beam evaporation, PLD, PA-PLD, ALD, PE-ALD); thin film microstructure characterization (*e.g.*, XRD, XRR, RHEED); surface sensitive characterization (*e.g.*, AFM, FE-SEM/STEM); magnetic characterization (*e.g.*, SQUID, VSM, MOKE, MFM); electron beam lithography (EBL); electrical (*e.g.*, I-V, C-V) and thermal (*e.g.*, Seebeck) transport measurements; optical measurements (*e.g.*, ellipsometry, Raman spectroscopy); ISO Class 5/6 clean-room; familiar with LabVIEW, MATLAB, Mathematica, and Python

REFEREED
PUBLICATIONS
(*h-index* = 12)

F. Zareanshahraki, H. R. Asemani, **J. Skuza**, and V. Mannari, *Prog. Org. Coat.* **138**, 105394 (2020). “Synthesis of non-isocyanate polyurethanes and their application in radiation-curable aerospace coatings”

C. On, E. K. Tanyi, M. Pashchanka, **J. R. Skuza**, V. N. Peters, and M. A. Noginov, *J. Opt. Soc. Am. B* **35**, 1785 (2018). “Spectroscopic studies of dye-doped porous alumina membranes”

M. K. Roul, B. Obasogie, G. Kogo, **J. R. Skuza**, R. M. Mundle, and A. K. Pradhan, *J. Appl. Phys.* **122**, 135110 (2017). “Transparent and flexible heaters based on Al:ZnO degenerate semiconductor”

J. R. Skuza, D. W. Scott, R. M. Mundle, and A. K. Pradhan, *Sci. Rep.* **6**, 21040 (2016). “Electro-thermal control of aluminum-doped zinc oxide/vanadium dioxide multilayered thin films for smart-device applications”

J. R. Skuza, D. W. Scott, and A. K. Pradhan, *J. Appl. Phys.* **118**, 195303 (2015). “Sapphire substrate-induced effects in VO₂ thin films grown by oxygen plasma-assisted pulsed laser deposition”

- A. K. Pradhan, R. M. Mundle, K. Santiago, **J. R. Skuza**, B. Xiao, K. D. Song, M. Bahoura, R. Cheaito, and P. E. Hopkins, *Sci. Rep.* **4**, 6415 (2014). “Extreme tunability in aluminum doped zinc oxide plasmonic materials for near-infrared applications”
- S. K. Pradhan, B. Xiao, **J. R. Skuza**, K. Santiago, R. Mundle, and A. K. Pradhan, *Optics Express* **22**, 12486 (2014). “Effects of dielectric thickness on optical behavior and tunability of one-dimensional Ag/SiO₂ multilayered metamaterials”
- W. M. Roach, **J. R. Skuza**, D. B. Beringer, Z. Li, C. Clavero, and R. A. Lukaszew, *Supercond. Sci. Technol.* **25**, 125016 (2012). “NbN thin films for superconducting radio frequency cavities”
- W. M. Roach, D. B. Beringer, **J. R. Skuza**, W. A. Oliver, C. Clavero, C. E. Reece, and R. A. Lukaszew, *Phys. Rev. ST Accel. Beams* **15**, 062002 (2012). “Niobium thin film deposition studies on copper surfaces for superconducting radio frequency cavity applications”
- C. Clavero, D. B. Beringer, W. M. Roach, **J. R. Skuza**, K. C. Wong, A. D. Batchelor, C. E. Reece, and R. A. Lukaszew, *Crystal Growth & Design* **12**, 2588 (2012). “Strain effects on the crystal growth and superconducting properties of epitaxial Niobium ultrathin films”
- J. R. Skuza**, C. Clavero, K. Yang, B. Wincheski, and R. A. Lukaszew, *IEEE Trans. Magn.* **46**, 1886 (2010). “Microstructural, magnetic anisotropy, and magnetic domain structure correlations in epitaxial FePd thin films with perpendicular magnetic anisotropy”
- K. Yang, C. Clavero, **J. R. Skuza**, M. Varela, and R. A. Lukaszew, *J. Appl. Phys.* **107**, 103924 (2010). “Surface plasmon resonance and magneto-optical enhancement on Au-Co nanocomposite thin films”
- C. Clavero, K. Yang, **J. R. Skuza**, and R. A. Lukaszew, *Optics Letters* **35**, 1557 (2010). “Magnetic-field modulation of surface plasmon polaritons on gratings”
- C. Clavero, K. Yang, **J. R. Skuza**, and R. A. Lukaszew, *Optics Express* **18**, 7743 (2010). “Magnetic field modulation of intense surface plasmon polaritons”
- C. Clavero, **J. R. Skuza**, Y. Choi, D. Haskel, C. Sanchez-Hanke, R. Loloee, M. Zherrenkov, M. R. Fitzsimmons, and R. A. Lukaszew, *Phys. Rev. B* **80**, 024418 (2009). “Enhancement of induced V polarization due to rough interfaces in polycrystalline V/Fe/V trilayers”
- C. Clavero, **J. R. Skuza**, J. M. Garcia-Martin, A. Cebollada, D. A. Walko, and R. A. Lukaszew, *Phys. Rev. B* **79**, 104436 (2009). “Order and phase nucleation in nonequilibrium nanocomposite Fe-Pt thin films with perpendicular magnetic anisotropy”
- C. Clavero, **J. R. Skuza**, Y. Choi, D. Haskel, J. M. Garcia-Martin, A. Cebollada, and R. A. Lukaszew, *Appl. Phys. Lett.* **92**, 162502 (2008). “Control of the perpendicular magnetic anisotropy of FePd films via Pd capping deposition”
- J. B. Gonzalez-Diaz, A. Garcia-Martin, G. Armelles, J. M. Garcia-Martin, C. Clavero, A. Cebollada, R. A. Lukaszew, **J. R. Skuza**, D. P. Kumah, and R. Clarke, *Phys. Rev. B* **76**, 153402 (2007). “Surface-magnetoplasmon nonreciprocity effects in noble-metal/ferromagnetic heterostructures”

J. R. Skuza, R. A. Lukaszew, E. M. Dufresne, D. A. Walko, C. Clavero, A. Cebollada, C. N. Cionca, and R. Clarke, *Appl. Phys. Lett.* **90**, 251901 (2007). “Real time structural modification of epitaxial FePt thin films under x-ray rapid thermal annealing using undulator radiation”

K. P. Acharya, **J. R. Skuza**, R. A. Lukaszew, C. Liyanage, and B. Ullrich, *J. Phys.: Condens. Matter* **19**, 196221 (2007). “CdS thin films formed on flexible plastic substrates by pulsed-laser deposition”

D. P. Kumah, A. Cebollada, C. Clavero, J. M. Garcia-Martin, **J. R. Skuza**, R. A. Lukaszew, and R. Clarke, *J. Phys. D: Appl. Phys.* **40**, 2699 (2007). “Optimizing the planar structure of (111) Au/Co/Au trilayers”

C. Sanchez-Hanke, R. Gonzalez-Arrabal, J. E. Pieta, E. Andrzejewska, N. Gordillo, D. O. Boerma, R. Loloee, **J. Skuza**, and R. A. Lukaszew, *J. Appl. Phys.* **99**, 08B709 (2006). “Observation of nitrogen polarization in Fe-N using soft x-ray magnetic circular dichroism”

NON-REFEREED
PUBLICATIONS

J. R. Skuza, Y. Park, H. J. Kim, S. T. Seaman, G. C. King, S. H. Choi, K. D. Song, H. Yoon, and K. Lee, NASA Technical Memorandum, NASA/TM-2014-218241 (2014). “Feasibility study of cargo airship transportation systems powered by new green energy technologies”

H. J. Kim, **J. R. Skuza**, Y. Park, G. C. King, S. H. Choi, and A. Nagavalli, NASA Technical Memorandum, NASA/TM-2012-217791 (2012). “System to measure thermal conductivity and Seebeck coefficient for thermoelectrics”

C. Clavero, D. Beringer, W. M. Roach, **J. R. Skuza**, R. A. Lukaszew, and C. E. Reece, *Proceedings of the 15th International Conference on RF Superconductivity (2011)*, Joint Accelerator Conferences Website (JACoW). “Strain effects in the superconducting properties of Nb thin films grown on sapphire”

K. Yang, C. Clavero, **J. R. Skuza**, and R. A. Lukaszew, *TechConnect World: Nanotech* **1**, 460 (2011). “Enhancement of the magneto-optical activity via surface plasmon resonance on Au-Co nanocomposite thin films”

J. R. Skuza, Ph.D. Dissertation (2011). “Thin film and chemical ordering effects on the magnetic anisotropy in binary alloys”

BOOK CHAPTERS

J. R. Skuza, Ch. 3 “*L1₀ Alloy Thin Films and Nanostructures*” in *Handbook of Nanomagnetism: Applications and Tools*, edited by R. A. Lukaszew (Pan Stanford, Boca Raton, FL, 2015). ISBN 978-981-4613-04-0 (Hardcover), 978-981-4613-05-7 (eBook).

PATENTS

Y. Park, H. J. Kim, **J. R. Skuza**, K. Lee, G. C. King, and S. H. Choi, U.S. Patent 9,835,570 granted December 5, 2017. “X-ray diffraction (XRD) characterization methods for sigma=3 twin defects in cubic semiconductor (100) wafers”

INVITED TALKS

“Nanomaterials for technological applications,” 73rd Annual Joint Meeting of Beta Kappa Chi National Scientific Honor Society and the National Institute of Science at Norfolk State University (2016).

“Tunable properties of Al:ZnO and VO₂ for devices,” NCC AVS Joint Users Group Meeting held in conjunction with the 36th Annual Equipment Exhibition and Student Poster Session in San Jose, CA (2015).

“Transition-metal oxides,” MAC AVS Meeting at the Thomas Jefferson National Accelerator Facility (2014).

“Thin film materials for next generation magnetic data storage media and devices,” 6th Annual Graduate Student Research Forum hosted by the Virginia Council of Graduate Schools in Richmond, VA (2011).

“Thin film materials for next generation magnetic data storage media and devices,” Applied Science Seminar Series at the College of William & Mary (2010).

“Magnetic thin films, nanostructures, and proximity effects,” National Institute of Standards and Technology in Gaithersburg, MD (2010).

“Magnetic thin films, nanostructures, and proximity effects,” Naval Research Laboratory in Washington, DC (2010).

AWARDS	Inducted into Sigma Pi Sigma, Physics Honor Society <i>Eastern Michigan University Chapter</i>	2017
	Graduate Research Fellowship <i>Virginia Space Grant Consortium</i>	2010
	First Place in Poster Competition at the D.C. Regional Meeting <i>Mid-Atlantic Chapter of the American Vacuum Society</i>	2010
	Award for Excellence in Undergraduate Mentoring <i>College of William & Mary</i>	2010
	NASA Langley Aerospace Research Summer Scholar (LARSS)	2009
	Boulder Summer School Participant <i>Condensed Matter and Materials Physics</i>	2008
	Leo M. Falicov Student Award Finalist <i>Magnetic Interfaces and Nanostructures Division of the American Vacuum Society</i>	2007, 2009
	Inducted into Phi Kappa Phi, Honor Society <i>The University of Toledo Chapter</i>	2007
	A. Jackson & Sally M. Smith Scholarship	2006
	Outstanding Teaching Assistant <i>American Association of Physics Teachers</i>	2005
	Dr. Emory C. Unnewehr Award in Physics	2004
	David D. Martin Scholarship in Mathematics	2003

	Inducted into Kappa Mu Epsilon, Mathematics Honor Society <i>Baldwin-Wallace University Chapter</i>	2003
COMPETITIVE INTRAMURAL FUNDING	Provost's Research Support Award, \$3,000 <i>Eastern Michigan University</i>	2020
	Summer Research Award, \$12,000 <i>Eastern Michigan University</i>	2017
	Arts & Sciences OGSR/GSA Conference Funds, \$400 <i>The College of William & Mary</i>	2009-2010
	Arts & Sciences Graduate Research Grant, \$600 <i>The College of William & Mary</i>	2008-2009
	Office of Student Activities Conference Funds, \$1,125 <i>The College of William & Mary</i>	2007-2010
COMPETITIVE EXTRAMURAL FUNDING	Graduate Research Fellowship, \$5,000 <i>Virginia Space Grant Consortium</i>	2010
	Special Projects Program Grant, \$870 <i>Materials Research Society</i>	2007
	Dorothy M. & Earl S. Hoffman Travel Grant, \$600 <i>American Vacuum Society</i>	2005-2006
OUTREACH	K-12 Outreach	
	• Adopt-a-Physicist Program (AIP/SPS, APS, and AAPT)	2017, 2018, 2020
	• Zoom into Nano at Portsmouth Public Library	2016
	• Virginia Junior Academy of Science <i>Judge for the Annual Research Symposium</i>	2016
	• NSU CSET Saturday Scientists Academy	2015-2016
	• Peabody Middle School GEAR UP STEM Visitation Day	2015
	• John Tyler Elementary School Career Day	2015
	• Time Out 4U, Inc. STEM Symposium	2015
	• NSU-CMR NanoDays Program at the Children's Museum of Virginia	2014-2016
	• W&M ARC Science Fair with the Boys & Girls Club of Suffolk	2014, 2015
	• NSU Science Alive Day with the Girl Scouts	2014
	• NSU-CMR High School Summer Program	2013-2015
	• Governor's School for Science & Technology <i>Evaluator for the Senior Mentorship Spring Research Symposium</i>	2012
	• NASA INSPIRE Program	Summer 2011
	• UT Physics High School Summer Camp	2005, 2006
	Public Outreach	
	• Ypsilanti Public Library Solar Eclipse Event	2017
	• Thomas Jefferson National Accelerator Facility Open House	2012, 2014
	• UT Physics Saturday Mornings with Science Program	2005-2006
PROFESSIONAL SERVICE	Scientific Society Leadership	
	• Magnetic Interfaces and Nanostructures Division of the American Vacuum Society <i>Executive Committee Member</i>	2015-2016

- Mid-Atlantic Chapter of the American Vacuum Society
Chair 2016
Vice-Chair 2013-2016
- William & Mary Graduate Arts & Sciences Honor Council
Interim Chief Justice 2010
Member 2009-2010
- UT/BGSU Joint Chapter of the Materials Research Society
Treasurer 2007

Journal Referee/Reviewer

- Advances in Condensed Matter Physics (*Hindawi Publishing Corporation*)
- Applied Physics Letters (*American Institute of Physics*)
- Applied Physics Letters Materials (*American Institute of Physics*)
- Functional Materials Letters (*World Scientific*)
- Journal of Physics: Condensed Matter (*Institute of Physics*)
- Journal of Physics D: Applied Physics (*Institute of Physics*)
Advisory Panel Member since 2016
- Journal of Superconductivity and Novel Magnetism (*Springer*)
- Journal of Vacuum Science & Technology B (*American Institute of Physics*)
- Materials (*MDPI*)
- Materials Research Express (*Institute of Physics*)
- Nanoscale Research Letters (*SpringerOpen*)
- Nanotechnology (*Institute of Physics*)
- Optical Materials Express (*OSA The Optical Society*)
- Scientific Reports (*Nature Publishing Group*)
- Smart Materials and Structures (*Institute of Physics*)

University and Departmental Committees

- General Education Subcommittee on Assessment
Knowledge of the Disciplines - Natural Sciences (GEKN) since 2019
- University Educational Environment & Facilities Committee since 2018
- William & Mary Alumni Magazine Graduate School Reporter since 2017
- Assessment Committee since 2016
- Grade Grievance Committee since 2016
- Instruction Committee
Chair 2018-2021
Member 2016-2018
- University Chemical Hygiene Committee since 2016
- William & Mary Graduate Arts & Sciences Honor Council
Interim Chief Justice 2010
Member 2009-2010

M.S. Thesis Advisor

- Punom Roy 2022
- Xhon Shameti 2022
- Jacob Nalepa (*currently at KBR*) April 2020
- Brendan Pickard (*currently at Delta College and Washtenaw CC*) March 2019
- Helen Cothrel (*currently at Kettering University*) July 2018

M.S. Thesis Committee Member

- Cainan Nichols (*currently at Northrop Grumman*) April 2020
- Leo Nofs (*currently at Auburn University*) July 2019
- Md. Sanyat Rabby (*currently at Western Michigan University*) May 2019
- Manika Ross July 2017

- Gugu N. Rutherford (*currently at NASA*) November 2015
- David W. Scott (*currently at NAVSEA - MARMC*) July 2015
- Candace Snow-Davis (*currently at Rite Aid, Pharmacist*) June 2015
- Hampton S. Terry April 2015
- Marcus H. Wiggs (*currently at Canon*) December 2014
- Donovan A. Thomas (*currently at Intel*) June 2014
- Irving K. Cashwell (*currently at Northrop Grumman*) June 2014

Ph.D. Dissertation Committee Member

- John P. Harris 2021
- Taliya Gunawansa 2021
- Samuel Danquah 2021
- Makhes K. Behera (*currently at NSU*) October 2020
- Monee K. Roul (*currently at Lam Research*) November 2018
- Gilbert Kogo (*currently at Intel*) August 2018

Symposium Organizing Committees

- “Spring Meeting of the Ohio-Region Section of the American Physical Society”
Eastern Michigan University 2017
- “Eighth and Ninth Annual Graduate Research Symposia”
Co-chair, College of William & Mary 2008-2010
- “Materials Research in Thin Films and Photovoltaics”
Co-chair, organized by the UT/BGSU MRS Chapter 2007

Professional Affiliations

- Advanced Laboratory Physics Association (ALPhA) since 2018
- Sigma Pi Sigma, Physics Honor Society
Eastern Michigan University Chapter since 2017
- Society of Photo-Optical Instrumentation Engineers (SPIE) 2012-2013
- IEEE & IEEE Magnetics Society 2010-2011
- Williamsburg Jaycees 2009-2016
- Phi Kappa Phi, Honor Society
The University of Toledo Chapter since 2007
- American Physical Society (APS) since 2006
- Materials Research Society (MRS) 2006-2011, 2015
- American Vacuum Society (AVS) since 2005
- Kappa Mu Epsilon, Mathematics Honor Society
Baldwin-Wallace University Chapter since 2003