Elizabeth L. Radue

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Profile

I am a physicist with more than 9 years of experience in academia and industry with a focus on materials science and optics. My expertise includes laser operation and engineering, surface plasmons/ ENZ modes, and optical properties of thin films. I have experience working with undergraduate students both in a mentoring capacity and in a teaching capacity.

Education

Ph.D. Physics, College of William and Mary, 2016
M.S. Physics, College of William and Mary, 2012
B.A. Physics, Mount Holyoke College, 2009

Teaching Experience

Assistant Professor, Physical Science, Advanced Electronics, Department of Physics and Astronomy, University of Wisconsin - Eau Claire 2021-2022
Lecturer, Physical Science, General Physics, Department of Physics and Astronomy, University of Wisconsin – Eau Claire 2021-2022
Teaching Assistant, Experimental Atomic Optics, Physics Department, College of William and Mary, 2015
Teaching Assistant, Introductory Physics, Physics Department, College of William and Mary, 2010-2011
Teaching Assistant, Physics Department, Mount Holyoke College 2007-2009

Research Experience

Carrier, Senior Research Scientist (2020-2021) Help improve design of smoke detectors, including both hardware and software.
Fibertek Inc., Laser Scientist (2019-2020). Worked on building and developing custom, high power lasers in the R&D department. Duties include ordering, building, and characterizing both fiber and bulk laser systems.
University of Virginia, Department of Mechanical and Aerospace Engineering, Exsite Lab, Postdoctoral Researcher (2016-2019). Research on thermal and plasmonic properties in nanomaterials using Time Domain Thermoreflectance (TDTR) and MIR Plasmonics with principal investigator, Dr. Patrick Hopkins.
The College of William and Mary, Department of Physics (*2010-2016*). Research on the dynamics of insulator-metal phase transition in Vanadium Dioxide thin films. Advisor: Dr. Irina Novikova.

Mount Holyoke College, Department of Physics, (2005-2009). New ways of understanding special relativity: Dr. Robert Salgado, Mount Holyoke College, 2009**.** Static charge in granular materials: Dr. Anthony Dinsmore, University of Mass. Amherst, Summer, 2008**.** Building optical tweezers: Dr. Ward Lopes, Mount Holyoke College, Spring 2007- 2008**.**

Techniques & Skills

Lasers and optics: operation and maintenance on ultrafast lasers (Mantis/Legend Elite/Topas), HeNe lasers, diode lasers, basic alignment, femtosecond-pulse characterization (autocorrelator), beam phase characterization

Lab equipment: Lock-in amplifiers, cryostat, sorption pumps, basic electronics

Sample Characterization: Time-Domain Thermoreflectance (TDTR), Raman spectroscopy, XRD, IR Spectroscopy, Four-point probe

Software: Matlab, Labview, OriginLab, Latex, Maple, Mathmatica

Awards & Grants

Outstanding Teaching Assistant Award, American Association of Physics Teachers, 2013

Cheryl Tropf Fellowship, College of William and Mary, Spring 2016

1st Place - AVS Mid-Atlantic Chapter Student Poster Competition, 2015

Award for Excellence in Scholarship, College of William and Mary, 2015

NASA Virginia Space Grant Consortium, Graduate Research Fellowship, 2013-2014 & 2014-2015

3rd Place - AVS Mid-Atlantic Chapter Student Poster Competition, 2012 **Shattuck Prize**, Mount Holyoke College, 2009

Professional Service & Affiliations

American Physics Society member, 2012-Present

Optical Society of America member, 2012-Present

American Ceramics Society member, 2017-2018

Department of Physics: Climate Steering Committee, College of William and Mary, 2015-2016

President, Physics Graduate Student Association, College of William and Mary, 2013-2014

Chapter President, OSA Student Chapter, College of William and Mary, 2012-2013

Graduate Liaison, William Small Distinguished Speaker, W&M, 2011-2012 **Secretary,** Society of Physics Students: Mount Holyoke Chapter, 2008-2009

Publications

E. Radue, E.L. Runnerstrom, K.P. Kelley, C.M. Rost, B.F. Donovan, E.D. Grimley, J.M. LeBeau, J.P. Maria, P.E. Hopkins, "Charge confinement and thermal transport processes in modulation-doped epitaxial crystals (MoDECs) lacking lattice interfaces," *Physical Review Materials* **3**, 032201 (2019).

E. Radue, J.A. Tomko, A. Giri, J.L. Braun, X. Zhou, O.V. Prezhdo, E.L. Runnerstrom, J.P. Maria, P.E. Hopkins, "Hot electron thermoreflectance coefficient of gold during electron-phonon nonequilibrium," *ACS Photonics* **5**, 4880-4887

E. Radue, L. Wang, S. Kittiwatanakul, J. Lu, S.A. Wolf, E. Rossi, R.A. Lukaszew, and I. Novikova, "Substrate-induced microstructure effects on the dynamics of the photo-induced metal–insulator transition in VO 2 thin films," Journal of Optics, **17**, 025503, Feb. 2015

E. Radue, E. Crisman, L. Wang, S. Kittiwatanakul, J. Lu, S.A. Wolf, R. Wincheski, R.A. Lukaszew, and I. Novikova, 'Effect of a substrate-induced microstructure on the optical properties of the insulator-metal transition temperature in VO2 thin films', Journal of Applied Physics **113**, 233104 (2013)

M. Rodriguez-Vega, M. T. Simons, E. Radue, S. Kittiwatanakul, J. Lu, S. A. Wolf, R. A. Lukaszew, I. Novikova, and E. Rossi, 'Effect of inhomogeneities and substrate on the dynamics of the metal-insulator transition in VO2 thin film', Phys. Rev. B **92**, 115420 (2015)

L. Wang, C. Clavero, K. Yang, E. Radue, M.T. Simons, I. Novikova, and R. A. Lukaszew, Optics Express **20**, 8618 (2012)

L. Wang, E. Radue, S. Kittiwatanakul, C. Clavero, J. Lu, S.A. Wolf, I. Novikova, and R. A. Lukaszew, Optics Letters **37**, 4335 (2012)

Presentations

E. Radue, E. Runnerstrom, K. Kelly, J. P. Maria, P. Hopkins, 'Time-dependent thermoreflectivity of doped CdO thin films with mid-IR surface plasmon polaritons' EMA, 2018, Orlando, FL

E. Radue, S. Kittiwatanakul, J. Lu, R. A. Lukaszew, I. Novikova, P. Hopkins, 'Pump-probe measurements of Vanadium dioxide above and below the bandgap' EMA, 2018, Orlando, FL

E. Radue, E. Runnerstrom, C. Rost, J. P. Maria, P. Hopkins, 'Contribution of Surface Plasmon Polaritons to Thermal Conductivity of Doped CdO Thin Films' MS&T, 2017, Pittsburg, PA

E. Radue, S. Kittiwatanakul, J. Lu, S. A. Wolf, Z. Fu, M. Yamaguchi, E. Rossi, I. Novikova, R. A. Lukaszew, 'Ultrafast dynamics of VO_2 thin films measured in pump-probe configuration ', March Meeting, 2016, Baltimore, MD

E. Radue, L. Wang, S. Kittiwatanakul, J. Lu, S.A. Wolf, R.A. Lukaszew, and I. Novikova, 'Study of microstructure effects on the photo-induced Metal-insulator transition in VO_2 thin films grown on Al_2O_3 and TiO_2' APS March Meeting, 2015, San Antonio TX

E. Radue, E. Crisman, L. Wang, S. Kittiwatanakul, J. Lu, S.A. Wolf, R.A. Lukaszew, and I. Novikova, 'Effect of strain on the dynamics of optically induced metal-insulator transitions of VO_2 thin films', APS March Meeting, 2014, Denver CO

E. Radue, E. Crisman, L. Wang, S. Kittiwatanakul, J. Lu, S.A. Wolf, R. Wincheski, R.A. Lukaszew, and I. Novikova 'Study of VO_2 Metal-Insulator Transition Temperature in thin films with Femtosecond pulses and Raman spectroscopy' Frontiers in Optics, 2013, Orlando FL

E. Radue, E. Crisman, L. Wang, S. Kittiwatanakul, J. Lu, S.A. Wolf, R. Wincheski, R.A. Lukaszew, and I. Novikova, 'Study of Insulator-Metal transition of VO2 thin films with ultrafast optical pulses', APS March Meeting, 2013, Baltimore, MD

E. Radue, 'Investigating Vanadium Dioxide insulator-metal transition with Raman and ultrafast pulses' William & Mary Graduate Research Symposium, 2012, Williamsburg, VA

E. Radue, L. Wang, M. T. Simons, C. Clavero, I. Novikova, R. A. Lukaszew. 'Optically Stimulated Insulator-Metal Transition in VO2' AVS Mid-Atlantic Regional Meeting, 2012, Newport News, VA