

## MATTHEW D. MCCLUSKEY

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### EDUCATION

- Ph.D. Physics, University of California, Berkeley, 1997
- M.A. Physics, University of California, Berkeley, 1993
- B.Sc. Physics, Massachusetts Institute of Technology, 1991

### EXPERIENCE

- WSU, Department of Physics and Astronomy, Professor, 2009–
- Chief Technology Officer and co-founder, Klar Scientific, 2016–
- WSU, Materials Science Program, member, 2001–
- WSU, Institute for Shock Physics, member, 1998–
- WSU, Department of Physics and Astronomy, Chair, 2012–16
- WSU, Materials Science Program, Interim Chair, 2008–9
- WSU, Department of Physics and Astronomy, Acting Chair, 2006–7
- WSU, Department of Physics, Associate Professor with tenure, 2004–9
- WSU, Department of Physics, Assistant Professor, 1998–2004
- Xerox Palo Alto Research Center (PARC), Postdoctoral Research Associate, 1997–8
- Lawrence Berkeley National Laboratory (LBNL), Graduate Student Researcher, 1993–6

### DISSERTATION

- **Title:** [Hydrogen Local Vibrational Modes in Semiconductors](#)
- **Committee:** Eugene Haller (chair), Peter Yu (co-chair), Steven Louie, and Daryl Czhran

### RESEARCH INTERESTS

- Optical and electrical properties of semiconductors and oxides
- Infrared spectroscopy of defects in semiconductors
- Synthesis and characterization of oxide materials
- High-pressure and shock compression physics
- Optical microscopy

### PROFESSIONAL SOCIETIES

- American Physical Society (APS)
- Materials Research Society (MRS)
- National Academy of Inventors (NAI), Senior Member
- SPIE (the international society for optics and photonics)

## **AWARDS**

- Senior Member, National Academy of Inventors, 2022
- Westinghouse Distinguished Professorship in Materials Science and Engineering, 2013–
- WSU College of Sciences New Faculty Performance Award, one awarded, 2002

### **Student awards (past 10 years)**

- Syeed Ahmed, MSEP Poster Presentation Winner (three awarded), 2021
- Leah Snyder, Ed & Virginia Donaldson Surface Science Fellowship, 2020
- Syeed Ahmed, Pacific Northwest AVS (PNW-AVS) poster 2<sup>nd</sup> prize, 2019
- Anya Rasmussen, WSU Association of Faculty Women Rigas Award, 2015
- Anya Rasmussen, Advanced Light Source Doctoral Fellowship in Residence, 2014–5
- Anya Rasmussen, student scholarship, Shock Compression and Condensed Matter conference, 2013

### **SERVICE AT WSU (past 10 years)**

#### **University**

- Entrepreneurial Faculty Ambassador (EFA), 2021–
- EFA Speaker Series Committee, 2022–
- Move In Volunteer, 2022
- Research Week panel on entrepreneurship, 2021
- Materials Science and Engineering Program Advisory Council, 2021–
- Commercialization Gap Fund Internal Review Committee, 2017–
- Provost Tenure and Promotion Committee, 2015–7
- Seed Grant Review Panel, 2010, 2014–6
- Academic Showcase Committee, 2011–2, 2014–7
- Keynote Speaker, Phi Beta Kappa Induction Ceremony, 2016
- Dean (College of Arts & Sciences) Review Committee, 2016
- Materials Science and Engineering Director Search Committee, 2014–5
- Materials Science and Engineering Advisory Committee, 2010–4, 2018–
- Faculty address, “Crimson Reads,” 2014

#### **College of Arts & Sciences**

- Safety Committee, 2021–
- *Ad hoc* Tenure and Promotion Committees, 2015–8

#### **Department of Physics & Astronomy**

- Chair, Safety/Space/Building Committee, 2018–
- Graduate Admissions Committee, 2021
- Promotion Guidelines Committee, 2019–20
- Department Chair, 2012–6

- Chair, Fiscal Analyst Search Committee, 2015
- Chair, Administrative Manager Search Committee, 2015
- Chair, Program Coordinator Search Committee, 2014
- Colloquium Coordinator, 2000, 2001, 2013
- Chair, Department Vision Committee, 2010–11
- Graduate Studies Committee, 2000–11 (Chair 2007–11)
- Research Experiences for Undergraduates (REU) Site, PI and Faculty Coordinator, 2007–10

## SERVICE OUTSIDE WSU

- Steering Committee, International Conference on Defects in Semiconductors (ICDS), 2019–
- Co-organizer, Focus Topic on Dopants and Defects in Semiconductors, APS March Meeting, 2009, 2013, 2021
- APS March Meeting Abstract Sorters' Meeting, 2003, 2020
- Chair, ICDS–30, Seattle, 2019
- International Advisory Committee, ICDS, 2003–17
- Program Committee, ICDS, 2015, 2017, 2021, and 2023
- National Science Foundation (NSF) review panels, 2002, 2009, 2012, 2017
- Chair, APS Northwest (APSNW) Meeting, 2015
- Department of Energy (DOE) review panels, 2009, 2010, 2011, 2013, 2015
- Environmental Molecular Sciences Laboratory (EMSL) User Executive Committee, 2011–14
- Corbett Prize Committee, ICDS, 2013
- APSNW Program Committee, 2005–6 and 2011–12
- Program Committee, Gordon Research Conference (GRC) on Defects in Semiconductors, 2010 and 2012
- Chair, GRC on Defects in Semiconductors, 2007–8 (Vice Chair 2005–6)
- Advisory Committee, University of Idaho DOE-EPSCOR Grant, 2005–7
- International Conference on Hydrogen in Materials organizing committee, 2002–6
- APSNW Executive Committee, 2004–5
- Co-organizer, Focus Topic on Wide-band-gap Semiconductors, APS March Meeting, 2004
- Co-organizer, Symposium on Hydrogen in Semiconductors, MRS Spring Meeting, 2004
- Session chair for various conferences

## REFEREEING

- **Journals:** ACS Photonics, Advanced Functional Materials, American Journal of Physics, Applied Materials and Interfaces, Applied Physics Letters, Applied Spectroscopy, Applied Surface Science, Canadian Journal of Physics, Central European Journal of Physics, Ceramics International, Chemical Physics Letters, Crystal Growth & Design, Crystals, IEEE Electron Device Letters, Japanese Journal of Applied Physics, Journal of Alloys and Compounds, Journal of Applied Physics, Journal of Chemical Physics, Journal of Crystal Growth, Journal of the Electrochemical Society, Journal of Luminescence, Journal of Nanomaterials, Journal of Nuclear Materials, Journal of Physical Chemistry, Journal of Physics D, Journal of Vacuum Science and Technology (JVST) A, JVST B, Materials Letters, Materials Research Bulletin, Materials Science in Semiconductor Processing, Materials Today, Nanoscale, Nanotechnology, Nature, Nature Materials, New Journal of Physics, Optical Materials Express, Organic Electronics, Physical

Review Applied, Physical Review B, Physica Status Solidi A, Physical Review Letters, Physical Review Materials, PLOS ONE, Reviews of Modern Physics, Semiconductor Science and Technology, Sensors and Actuators B, Thin Solid Films

- **Funding agencies:** DOE, NSF, Deutsche Forschungsgemeinschaft (DFG), Natural Sciences and Engineering Research Council of Canada, Petroleum Research Fund (PRF), United States – Israel Binational Science Foundation, National Science Center Poland
- **Other:** Advanced Light Source (ALS), Environmental Molecular Sciences Laboratory / Pacific Northwest National Laboratory (EMSL/PNNL), Le Studium, Stanford Synchrotron Radiation Laboratory, book proposals, tenure applications, external examiner/reader for Ph.D. committees (University of Alberta and Simon Fraser University)

## OUTREACH

- MIT Educational Counselor, 2014–18
- MIT Reunion Gift Committee, 2015–6
- Contributor to WSU’s *Ask Dr. Universe* column
- Physics videos on YouTube
- Leader, Franklin Elementary Math Club, 2009–10
- Recruiting trip, 2009 Joint Annual Conference of the National Society of Black Physicists and the National Society of Hispanic Physicists
- Team Leader, “Kids Judge” neuroscience event, 2006
- Development of lab exercises for the Nespelem school, on the Colville Indian reservation in northeast Washington, for 8<sup>th</sup> grade class
- Organized visits by WSU Children’s Center (ages: 2-10)
- Mentor for Pullman High School senior science project
- Physics demonstrations for elementary students

## PUBLICATIONS

### Summary

- Authored or co-authored over 100 peer-reviewed publications and 2 textbooks.  $H$ -index = 38 ([Google Scholar](#), 6/6/2023).
- Top citations, work done at WSU:
  - 1,220: “Defects in ZnO,” *J. Appl. Phys.* (2009)
  - 336: “Tutorial: Defects in semiconductors—Combining experiment and theory,” *J. Appl. Phys.* (2016)
  - 231: “Infrared spectroscopy of hydrogen in ZnO,” *Appl. Phys. Lett.* (2002)
  - 187: *Dopants and Defects in Semiconductors* (CRC Press, 2018)
  - 174: “Persistent photoconductivity in strontium titanate,” *Phys. Rev. Lett.* (2013)
  - 167: “Nitrogen is a deep acceptor in ZnO,” *AIP Advances* (2011), *most cited AIP Advances article in 2012*
  - 157: “Local vibrational modes of impurities in semiconductors,” *J. Appl. Phys.* (2000)
  - 147: “Structure and stability of O-H donors in ZnO from high-pressure and infrared spectroscopy,” *Phys. Rev. B* (2005)
  - 136: “Ferromagnetism in  $\text{Ga}_{1-x}\text{Mn}_x\text{P}$ : Evidence for inter-Mn exchange mediated by localized holes within a detached impurity band,” *Phys. Rev. Lett.* (2005)
  - 135: “Point defects in  $\text{Ga}_2\text{O}_3$ ,” *J. Appl. Phys.* (2020)
- Top citations, work done before WSU:
  - 269: “Large band gap bowing of  $\text{In}_x\text{Ga}_{1-x}\text{N}$  alloys,” *Appl. Phys. Lett.* (1998)
  - 251: “Phase separation in InGaN/GaN multiple quantum wells,” *Appl. Phys. Lett.* (1998)
  - 243: “Local vibrational modes of the Mg-H acceptor complex in GaN,” *Appl. Phys. Lett.* (1996)
  - 215: “Metastability of oxygen donors in AlGaN,” *Phys. Rev. Lett.* (1998)
  - 212: “Fano interference of the Raman phonon in heavily boron-doped diamond films grown by chemical vapor deposition,” *Appl. Phys. Lett.* (1995)
  - 184: “Optical properties of InGaN alloys grown by metalorganic chemical vapor deposition,” *J. Appl. Phys.* (1998)

### Journal Articles (peer-reviewed)

*Work done at WSU (2020–)*

152. L.M. Barmore, A.M. Rasmussen, B. Whitfield, and M.D. McCluskey, Phase transition in heptane under pressure, *J. Phys. Chem. Lett.* (submitted).
151. M.D. McCluskey, Resonant interactions involving local vibrational modes in crystals, *J. Appl. Phys.* (accepted).
150. B.L. Dutton, J.B. Varley, C. Remple, J. Jesenovec, B.K. Downing, J.-X. Shen, S. Ghandiparsi, A. Neal, Y. Kim, A. Green, L.F. Voss, M.D. McCluskey, and J.S. McCloy, Melt-grown semi-insulating Mn:β-Ga<sub>2</sub>O<sub>3</sub> single crystals exhibiting unique visible absorptions and luminescence, *J. Vac. Sci. Tech. A* (submitted).
149. J.E. Stehr, M. Jansson, S.J. Pearton, J. S. McCloy, J. Jesenovec, B.L. Dutton, M.D. McCluskey, W.M. Chen, and I.A. Buyanova, Color center in β-Ga<sub>2</sub>O<sub>3</sub> emitting at the telecom range, *Appl. Phys. Lett.* (submitted).

148. I. Lukman, M.D. McCluskey, and L. Bergman, Ultra-wide bandgap gallium oxide films: UV-luminescence and phonon dynamics at extreme temperatures, *AIP Advances* (submitted).
147. L.M. Barmore, J. Jesenovec, J.S. McCloy, and M.D. McCluskey, Photoluminescence of Cr<sup>3+</sup> in  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> and (Al<sub>0.1</sub>Ga<sub>0.9</sub>)<sub>2</sub>O<sub>3</sub> under pressure, *J. Appl. Phys.* **133**, 175703:1-9 (2023).
146. S.E. Ahmed, V.M. Poole, J. Jesenovec, B.L. Dutton, J.S. McCloy, and M.D. McCluskey, Room temperature persistent photoconductivity in barium calcium titanate, *J. Electronic Mater.* **52**, 2499-2504 (2023).
145. C. Remple, L.M. Barmore, J. Jesenovec, J.S. McCloy, and M.D. McCluskey, Photoluminescence spectroscopy of Cr<sup>3+</sup> in  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> and (Al<sub>0.1</sub>Ga<sub>0.9</sub>)<sub>2</sub>O<sub>3</sub>, *J. Vac. Sci. Tech. A* **41**, 022702:1-7 (2023).
144. J. Jesenovec, B.L. Dutton, C. Remple, N. Smith-Gray, M. Murugesan, C. Peterson, B.K. Downing, S. Krishnamoorthy, M.D. McCluskey, and J.S. McCloy, Alternative alloy to increase bandgap in gallium oxide,  $\beta$ -(Sc<sub>x</sub>Ga<sub>1-x</sub>)<sub>2</sub>O<sub>3</sub>, and rare earth Stark luminescence, *J. Crystal Growth* **596**, 126823:1-9 (2022).
143. T.D. Gustafson, N.C. Giles, B.C. Holloway, J. Jesenovec, B.L. Dutton, J.S. McCloy, M.D. McCluskey, and L.E. Halliburton, Transition-metal ions in  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> crystals: Identification of Ni acceptors, *J. Appl. Phys.* **132**, 185705:1-7 (2022).
142. H.-S. Lee, M.W. Rahman, D. Verma, V.M. Poole, R.C. Myers, M.D. McCluskey, and S. Rajan, Selectively-patterned Mg-doped GaN by SiN<sub>x</sub>-driven hydrogen injection, *J. Vac. Sci. Tech. B* **40**, 062201:1-6 (2022).
141. Y. Yu and M.D. McCluskey, Classification of semiconductors using photoluminescence spectroscopy and machine learning, *Applied Spectroscopy* **76**(2), 228-234 (2022).
140. T.D. Gustafson, N.C. Giles, B.C. Holloway, C.A. Lenyk, J. Jesenovec, J. S. McCloy, M.D. McCluskey, and L.E. Halliburton, Cu<sup>2+</sup> and Cu<sup>3+</sup> acceptors in  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> crystals: A magnetic resonance and optical absorption study, *J. Appl. Phys.* **131**, 065702:1-14 (2022).
139. J. Jesenovec, C. Pansegrouw, M.D. McCluskey, J.S. McCloy, T.D. Gustafson, L.E. Halliburton, and J.B. Varley, Persistent room temperature photodarkening in Cu-doped  $\beta$ -Ga<sub>2</sub>O<sub>3</sub>, *Phys. Rev. Lett.* **128**, 077402:1-6 (2022).
138. C. Pansegrouw and M.D. McCluskey, Persistent photoconductivity in barium titanate, *J. Appl. Phys.* **131**, 095701:1-4 (2022).
137. J. Jesenovec, C. Remple, J. Huso, B. Dutton, P. Toews, M.D. McCluskey, and J.S. McCloy, Photodarkening and dopant segregation in Cu-doped  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> Czochralski single crystals, *J. Crystal Growth* **578**, 126419:1-9 (2022).
136. C. Remple, J. Huso, and M.D. McCluskey, Photoluminescence and Raman mapping of  $\beta$ -Ga<sub>2</sub>O<sub>3</sub>, *AIP Advances* **11**, 105006:1-6 (2021).
135. C. Pansegrouw, J. Jesenovec, J.S. McCloy, M.D. McCluskey, Zinc-hydrogen and zinc-iridium pairs in  $\beta$ -Ga<sub>2</sub>O<sub>3</sub>, *Appl. Phys. Lett.* **119**, 102104:1-4 (2021).
134. S.E. Ahmed, V.M. Poole, J. Igo, Y. Gu, and M.D. McCluskey, Localized phase transition of TiO<sub>2</sub> thin films induced by sub-bandgap laser irradiation, *J. Vac. Sci. Tech. A* **39**, 053402:1-6 (2021).
133. J. Jesenovec, M. Weber, C. Pansegrouw, M.D. McCluskey, K.G. Lynn, and J.S. McCloy, Gallium vacancy formation and configuration in unintentionally doped  $\beta$ -Ga<sub>2</sub>O<sub>3</sub>, *J. Appl. Phys.* **129**, 245701:1-9 (2021).
132. T.D. Gustafson, J. Jesenovec, C.A. Lenyk, N.C. Giles, J.S. McCloy, M.D. McCluskey, and L.E. Halliburton, Zn acceptors in  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> crystals, *J. Appl. Phys.* **129**, 155701:1-10 (2021).
131. J. Huso, M.D. McCluskey, Y. Yu, Md. M. Islam, and F. Selim, Localized UV emitters on the surface of Ga<sub>2</sub>O<sub>3</sub>, *Scientific Reports* **10**, 21022:1-7 (2020).
130. J.R. Ritter, M.J. Caldas, T.J. da Silva, A. Calzolari, and M.D. McCluskey, Surface effects on pyrene luminescence excitation, *ACS Applied Electronic Materials* **2**, 2806-2812 (2020).

129. J. Lapp, D. Thapa, J. Huso, A.J. Canul, M.G. Norton, M.D. McCluskey, and L. Bergman, **Enhancement of the ultraviolet photoluminescence of ZnO films: Coatings, annealing, and environmental exposure studies**, *AIP Advances* **10**, 085217:1-8 (2020).
128. M.D. McCluskey and A. Janotti, **Defects in semiconductors**, *J. Appl. Phys.* **127**, 190401:1-3 (2020).
127. S.E. Ahmed, J. Huso, J.R. Ritter, J. Igo, Y. Gu, and M.D. McCluskey, **Insulating regions in a TiO<sub>2</sub> thin film defined by laser irradiation**, *J. Vac. Sci. Tech. B* **38**, 032203:1-7 (2020).
126. Y. Yu, X. Ye, and M.D. McCluskey, **Confocal microscopy with a microlens array**, *Applied Optics* **59**, 3058-3063 (2020).
125. M.D. McCluskey, **Point defects in Ga<sub>2</sub>O<sub>3</sub>**, *J. Appl. Phys.* **127**, 101101:1-13 (2020). [Featured Article](#).

*Work done at WSU (2010–2019)*

124. J.R. Ritter, K.G. Lynn, and M.D. McCluskey, **Iridium-related complexes in Czochralski-grown β-Ga<sub>2</sub>O<sub>3</sub>**, *J. Appl. Phys.* **126**, 225705:1-6 (2019).
123. J. Huso, J.R. Ritter, L. Bergman, and M.D. McCluskey, **High order oxygen local vibrational modes in ZnS<sub>1-x</sub>O<sub>x</sub>**, *Phys. Stat. Solidi B* **2019**, 1800607:1-9 (2019).
122. J. Huso, L. Bergman, and M.D. McCluskey, **Bandgap of cubic ZnS<sub>1-x</sub>O<sub>x</sub> from optical transmission spectroscopy**, *J. Appl. Phys.* **125**, 075704:1-5 (2019).
121. D. Thapa, J. Huso, J. Lapp, N. Rajabi, J. Morrison, M.D. McCluskey, and L. Bergman, **Thermal stability of ultra-wide-bandgap MgZnO alloys with wurtzite structure**, *Journal of Materials Science: Materials in Electronics* **29**, 16782-16790 (2018).
120. J.R. Ritter, J. Huso, P.T. Dickens, J.B. Varley, K.G. Lynn, and M.D. McCluskey, **Compensation and hydrogen passivation of magnesium acceptors in β-Ga<sub>2</sub>O<sub>3</sub>**, *Appl. Phys. Lett.* **113**, 052101:1-5 (2018).
119. J. Huso, J.R. Ritter, D. Thapa, K.M. Yu, L. Bergman, and M.D. McCluskey, **Oxygen vibrational modes in ZnS<sub>1-x</sub>O<sub>x</sub> alloys**, *J. Appl. Phys.* **123**, 161537:1-5 (2018).
118. V.M. Poole, J. Huso, and M.D. McCluskey, **The role of hydrogen and oxygen in the persistent photoconductivity of strontium titanate**, *J. Appl. Phys.* **123**, 161545:1-5 (2018).
117. N.S. Parmar, J.-W. Choi, L.A. Boatner, M.D. McCluskey, and K.G. Lynn, **Formation of high concentrations of isolated Zn vacancies and evidence for their acceptor levels in ZnO**, *Journal of Alloys and Compounds* **729**, 1031-1037 (2017).
116. V.M. Poole, S.J. Jokela, and M.D. McCluskey, **Using persistent photoconductivity to write a low-resistance path in SrTiO<sub>3</sub>**, *Scientific Reports* **7**, 6659:1-6 (2017).
115. X. Ye and M.D. McCluskey, **Subtractive imaging using Gaussian fits and image moments in confocal microscopy**, *Res. J. Opt. Photonics* **1**(1), 1000102:1-5 (2017).
114. Q. Wang, L. Yang, S. Zhou, X. Ye, Z. Wang, W. Zhu, M.D. McCluskey, and Y. Gu, **Phase-defined Van der Waals Schottky junctions with significantly enhanced thermoelectric properties**, *J. Phys. Chem. Lett.* **8**, 2887-2894 (2017).
113. D. Thapa, J. Huso, K. Miklos, P.M. Wojcik, D.N. McIlroy, J.L. Morrison, C. Corolewski, M.D. McCluskey, T.J. Williams, M.G. Norton, and L. Bergman, **UV-luminescent MgZnO semiconductor alloys: Nanostructure and optical properties**, *J. Mat. Sci.:Mater. Electron.* **28**, 2511-2520 (2017).
112. X. Ye and M.D. McCluskey, **Modular scanning confocal microscope with digital image processing**, *PLoS ONE* **11**(11), e0166212:1-14 (2016).
111. A.M. Rasmussen, E. Mafi, W. Zhu, Y. Gu, and M.D. McCluskey, **High pressure γ-to-β phase transition in bulk and nanocrystalline In<sub>2</sub>Se<sub>3</sub>**, *High Pressure Res.* **36**, 549-56 (2016).

110. D. Thapa, J. Huso, J.L. Morrison, C.D. Corolewski, M.D. McCluskey, and Leah Bergman, **Achieving highly-enhanced UV photoluminescence and its origin in ZnO nanocrystalline films**, *Optical Materials* **58**, 382–9 (2016).
109. C.D. Corolewski, N.S. Parmar, K.G. Lynn, and M.D. McCluskey, **Hydrogen-related complexes in Li-diffused ZnO single crystals**, *J. Appl. Phys.* **120**, 035702:1-5 (2016).
108. A. Alkauskas, M.D. McCluskey, and C.G. Van de Walle, **Tutorial: Defects in semiconductors—Combining experiment and theory**, *J. Appl. Phys.* **119**, 181101:1-11 (2016).
107. S.T. Hung, A. Bhuyan, K. Schademan, J. Steverlynck, M.D. McCluskey, G. Koeckelberghs, K. Clays, and M.G. Kuzyk, **Spectroscopic studies of the mechanism of reversible photodegradation of 1-substituted aminoanthraquinone-doped polymers**, *J. Chem. Phys.* **144**, 114902:1-17 (2016).
106. K.W. Harrison, C.D. Corolewski, M.D. McCluskey, J. Lindemuth, S. Ha, and M.G. Norton, **Electronic transport in molybdenum dioxide thin films**, *J. Mater. Sci.: Mater. Electron.* **26**, 9717-20 (2015).
105. V.M. Poole, C.D. Corolewski, and M.D. McCluskey, **P-type conductivity in annealed strontium titanate**, *AIP Advances* **5**, 127217:1-4 (2015).
104. N.S. Parmar, C.D. Corolewski, M.D. McCluskey, and K.G. Lynn, **Potassium acceptor doping of ZnO crystals**, *AIP Advances* **5**, 057107:1-7 (2015).
103. J. Huso, H. Che, D. Thapa, A. Canul, M.D. McCluskey, and L. Bergman, **Phonon dynamics and Urbach energy studies of MgZnO alloys**, *J. Appl. Phys.* **117**, 125702:1-8 (2015).
102. M.D. McCluskey, C.D. Corolewski, J. Lv, M.C. Tarun, S.T. Teklemichael, E.D. Walter, M.G. Norton, K.W. Harrison, and S. Ha, **Acceptors in ZnO**, *J. Appl. Phys.* **117**, 112802:1-6 (2015).
101. F.A. Selim, D. Winarski, C.R. Varney, M.C. Tarun, Jianfeng Ji, and M.D. McCluskey, **Generation and characterization of point defects in SrTiO<sub>3</sub> and Y<sub>3</sub>Al<sub>5</sub>O<sub>12</sub>**, *Results in Physics* **5**, 28-31 (2015).
100. S.T. Teklemichael, M.D. McCluskey, G. Buchowicz, O.D. Dubon, and E.E. Haller, **Evidence for a shallow Cu acceptor in Si from infrared spectroscopy and photoconductivity**, *Phys. Rev. B* **90**, 165204:1-4 (2014).
99. J.M. Philipps, J.E. Stehr, I. Buyanova, M.C. Tarun, M.D. McCluskey, B.K. Meyer, and D.M. Hofmann, **Recharging behavior of nitrogen-centers in ZnO**, *J. Appl. Phys.* **116**, 063701:1-4 (2014).
98. J. Huso, J.L. Morrison, L. Bergman, and M.D. McCluskey, **Anharmonic resonant Raman modes in Mg<sub>0.2</sub>Zn<sub>0.8</sub>O**, *Phys. Rev. B* **87**, 125205:1-5 (2013).
97. E.H. Khan, M.H. Weber, and M.D. McCluskey, **Formation of isolated Zn vacancies in ZnO single crystals by absorption of ultraviolet radiation: A combined study using positron annihilation, photoluminescence, and mass spectroscopy**, *Phys. Rev. Lett.* **111**, 017401:1-5 (2013).
96. F. Tuomisto, C. Rauch, M.R. Wagner, A. Hoffmann, S. Eisermann, B.K. Meyer, L. Kilanski, M.C. Tarun, and M.D. McCluskey, **Nitrogen and vacancy clusters in ZnO**, *Journal of Materials Research* **28**, 1977-83 (2013).
95. M.C. Tarun, F.A. Selim, and M.D. McCluskey, **Persistent photoconductivity in strontium titanate**, *Phys. Rev. Lett.* **111**, 187403:1-5 (2013).
94. F.A. Selim, C.R. Varney, M.C. Tarun, M.C. Rowe, G.S. Collins, and M.D. McCluskey, **Positron lifetime measurements of hydrogen passivation of cation vacancies in yttrium aluminum oxide garnets**, *Phys. Rev. B* **88**, 174102:1-5 (2013).
93. A.M. Rasmussen, S.T. Teklemichael, E. Mafi, Y. Gu, and M.D. McCluskey, **Pressure-induced phase transformation of In<sub>2</sub>Se<sub>3</sub>**, *Appl. Phys. Lett.* **102**, 062105:1-4 (2013).
92. P. Grivickas, M.D. McCluskey, and Y.M. Gupta, **Use of dynamic compression to probe semiconductor response at large strains**, *Physica Status Solidi B* **250**, 683-7 (2013).

91. N.S. Parmar, M.D. McCluskey, and K.G. Lynn, [Vibrational spectroscopy of Na-H complexes in ZnO](#), *Journal of Electronic Materials* **42**, 3426-8 (2013).
90. S.T. Teklemichael and M.D. McCluskey, [Compensation of acceptors in ZnO nanocrystals by adsorption of formic acid](#), *J. Phys. Chem. C* **116**, 17248-51 (2012).
89. F.A. Selim, M.C. Tarun, D.E. Wall, L.A. Boatner, and M.D. McCluskey, [Erratum: “Cu-Doping of ZnO by nuclear transmutation” \[Appl. Phys. Lett. 99, 202109 \(2011\)\]](#), *Appl. Phys. Lett.* **101**, 029901 (2012).
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14. H.Y. Peng, M.D. McCluskey, Y.M. Gupta, M. Kneissl, and N.M. Johnson, [Band gap shift of GaN under uniaxial strain compression](#), *MRS Proceedings* **693**, I11.49 (5 pages) (2001).\*
13. M.D. McCluskey, K.K. Zhuravlev, M. Kneissl, W. Wong, D. Treat, S. Limpijumnong, C.G. Van de Walle, and N.M. Johnson, [Vibrational spectroscopy of GaN:Mg under pressure](#), *MRS Proceedings* **693**, I2.4 (6 pages) (2001).\*
12. M. Kneissl, D.P. Bour, L.T. Romano, D. Hofstetter, M.D. McCluskey, C.J. Dunnrowicz, M. Teepe, R.M. Wood, and N.M. Johnson, [Characterization of InGaN/AlGaN multiple-quantum-well laser diodes](#), *Proc. SPIE* **3625**, DOI: 10.1117/12.356863 (1999).
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10. C.G. Van de Walle, C. Stampfl, J. Neugebauer, and M.D. McCluskey, [Doping of AlGaN alloys](#), *MRS Proceedings* **537**, G10.4 (12 pages) (1999).\*

9. D.P. Bour, M. Kneissl, N.M. Johnson, L. Romano, B.S. Krusor, M. McCluskey, W. Götz, and R.D. Bringand, [Characterization of AlGaN heterostructures and laser diodes](#), *Proc. SPIE* **3284**, DOI: 10.1117/12.304435 (1998).
8. M.D. McCluskey, N.M. Johnson, C.G. Van de Walle, and D.P. Bour, [Evidence for oxygen DX centers in AlGaN](#), *MRS Proceedings* **512**, 531-6 (1998).\*
7. M.D. McCluskey, [Hydrogen local vibrational modes in compound semiconductors](#), *MRS Proceedings* **513**, 217-28 (1998).\*
6. W. Shan, J.W. Ager III, W. Walukiewicz, E.E. Haller, M.D. McCluskey, N.M. Johnson, and D.P. Bour, [Pressure dependence of optical transitions in InGaN/GaN multiple quantum wells](#), *MRS Proceedings* **537**, G3.15 (6 pages) (1998).\*
5. M.D. McCluskey, E.E. Haller, W. Walukiewicz, and P. Becla, [Resonant interaction between local vibrational modes and extended lattice phonons in AlSb](#), *Mat. Sci. Forum* **258-263**, 1247-52 (1997).\*
4. E.E. Haller and M.D. McCluskey, [Infrared optical studies of semiconductors at large hydrostatic pressures](#), *MRS Proceedings* **499**, 371-80 (1997).\*
3. M.D. McCluskey, L.T. Romano, B.S. Krusor, and D.P. Bour, [Phase separation in InGaN/GaN multiple quantum wells](#), *MRS Proceedings* **482**, 985-9 (1997).\*
2. W. Götz, M.D. McCluskey, N.M. Johnson, and D.P. Bour, [Spectroscopic identification of the acceptor-hydrogen complex in Mg-doped GaN grown by MOCVD](#), *MRS Proceedings* **468**, 117-22 (1997).\*
1. M.D. McCluskey, E.E. Haller, J. Walker, and N.M. Johnson, “Local vibrational mode spectroscopy of beryllium-hydrogen and zinc-hydrogen complexes in GaP,” *Inst. Phys. Conf. Ser.* No. **141**, 287-90 (1995).\*

## Books

- M.D. McCluskey, *No-Frills Physics: A Concise Guide for Algebra-Based Physics* (CRC Press, Boca Raton, FL, 2019). ISBN 978-1138583870.
- M.D. McCluskey and E.E. Haller, *Dopants and Defects in Semiconductors*, 2<sup>nd</sup> edition (CRC Press, Boca Raton, FL, 2018). ISBN 978-1138035195.
- M.D. McCluskey, *Physics: A Problem Solving Approach* (Confocal Media, 2015). ISBN 978-0692448915 (out of print).
- M.D. McCluskey, *The Last Weapon: A Novel* (Confocal Media, 2013). ISBN 978-0615823225.
- M.D. McCluskey and E.E. Haller, *Dopants and Defects in Semiconductors* (CRC Press, Boca Raton, FL, 2012). ISBN 978-1439831526.

## Book chapters

- M.D. McCluskey, [Vibrational spectroscopy](#), in *Characterisation and Control of Defects in Semiconductors*, ed. F. Tuomisto (IET, United Kingdom, 2019), Ch. 3. ISBN 978-1785616556.
- M.D. McCluskey, [Defects in ZnO](#), in *Defects in Advanced Electronic Materials and Novel Low Dimensional Structures*, ed. I. Buyanova, W. Chen, and J. Stehr (Elsevier, 2018), 1-25. ISBN 978-0081020531.
- M.D. McCluskey, [High pressure IR](#), in *Encyclopedia of Spectroscopy and Spectrometry*, 3<sup>rd</sup> edition, Vol. 2, ed. J.C. Lindon, G.E. Tranter, and D.W. Koppenaal (Oxford: Elsevier, 2017), 122-125. ISBN 978-0128032244.
- M.D. McCluskey, [Point defects in ZnO](#), in *Semiconductors and Semimetals* **91**, ed. C. Jagadish, V. Privitera, and L. Romano (Elsevier, 2015), 279-313. ISBN 978-0128019351.

- S. Jokela and M. McCluskey, “Hydrogen in ZnO,” in *Zinc Oxide, the Future material for Electronics: A Comprehensive Review on ZnO Physics and Defects*, ed. F. Selim (Research Signpost, Kerala, India, 2011), 117-140. ISBN 978-8130803920.
- M.D. McCluskey and E.E. Haller, [Vibrational spectroscopy of hydrogen in III-V and II-VI semiconductors](#), in *Semiconductors in Semimetals* **61**, ed. N.H. Nickel (Academic Press, 1999), 373-440. ISBN 978-0127521701.

## **Editing**

- Special Topic on Defects in Semiconductors, *Journal of Applied Physics*, guest editors A. Janotti and M.D. McCluskey (2019).
- *Hydrogen in Semiconductors*, edited by N.H. Nickel, M.D. McCluskey, and S.B. Zhang (Mat. Res. Soc. Symp. Proc. **813**, Warrendale, PA, 2004). ISBN 978-1558997639.

## **PATENTS**

- M.D. McCluskey, [Digital confocal optical profile microscopy](#), No. US 9,891,422 B2
  - Filed 9/05/2013, granted 2/13/2018
  - Provisional application No. 61/700,198, filed 9/12/2012
- M.D. McCluskey, [Modular scanning confocal optical profile microscopy with digital image processing](#), No. US 10,989,903 B2
  - Filed 2/26/2019, granted 4/27/2021
  - Provisional application No. 62/635,134, filed 2/26/2018
- J. Huso, R.S. Lytel, M.D. McCluskey, and V.M. Poole, Spectroscopic microscope with changeable components
  - Filed 6/21/2022, Pending
  - Provisional application No. 63/213,895, filed 6/23/2021

## **PRESENTATIONS (past 10 years, oral contributions unless noted)**

- “Photoluminescence mapping of defects in  $\beta$ -Ga<sub>2</sub>O<sub>3</sub>,” MRS Spring Meeting 2024 ([invited](#))
- “Physics of crystal colors,” APS March Meeting, 2024 ([invited](#))
- “Photoluminescence mapping of surface defects on  $\beta$ -Ga<sub>2</sub>O<sub>3</sub>,” Conference on Electronic Materials and Applications (EMA), 2024
- “Photoluminescence maps of surface defects in  $\beta$ -Ga<sub>2</sub>O<sub>3</sub>,” Conference on the Physics and Chemistry of Surfaces and Interfaces (PSCI-49, 2024)
- “Defects in gallium oxide imaged by photoluminescence microscopy,” MRS Fall Meeting 2023
- “Deep UV photoluminescence mapping of gallium oxide,” AVS, 2023
- “Using light to study – and change – defects,” ICDS-32, 2023 ([invited](#))
- “Photoluminescence mapping of semiconductors and oxides,” PNW-AVS, 2022 and 2023
- “Persistent photoconductivity in perovskite oxide semiconductors,” APS March Meeting, 2023
- “Persistent optical phenomena in oxide semiconductors,” Photonics West, 2023 ([invited](#))
- “Using light to change hydrogen-related defects in oxide semiconductors,” GRC on Defects in Semiconductors, 2022 ([invited](#))
- “Photoluminescence mapping of light-emitting devices and materials,” Phosphor Safari – The 12<sup>th</sup> International Symposium for Luminescent Materials, 2022 ([invited](#), virtual)
- “Defects in – and on – gallium oxide,” APS March Meeting, 2022 ([invited](#))
- “Defects in gallium oxide, in the bulk and on the surface,” ICDS-31, 2021 (virtual)

- “Defects in gallium oxide,” Physical Behavior of Materials DOE-BES PI Meeting, 2021 (invited poster)
- “Acceptors in gallium oxide,” EMA, APS March Meeting, and MRS Spring Meeting (2021, virtual)
- “Photoluminescence mapping of semiconductors with high spatial resolution,” OSA Optical Sensors and Sensing Congress, Applied Industrial Spectroscopy, 2020 (virtual)
- “Defining insulating regions on TiO<sub>2</sub> thin films by laser heating,” PCSI-47, 2020 (oral and poster)
- “Defects in oxide semiconductors and ternary alloys,” Physical Behavior of Materials DOE-BES PI Meeting, 2019 (invited)
- “Modifying the conductivity of strontium titanate by light exposure,” EMA, 2019 (invited)
- “Compensation and passivation of magnesium acceptors in  $\beta$ -Ga<sub>2</sub>O<sub>3</sub>,” GRC on Defects in Semiconductors, 2018 (poster)
- “Hydrogen is the prime suspect for persistent photoconductivity in SrTiO<sub>3</sub>,” APS March Meeting, 2018
- “Acceptors in oxide semiconductors: The *p*-type quest continues,” ICDS-29, 2017 (invited plenary)
- “Zinc oxide and its alloys,” Physical Behavior of Materials DOE-BES PI Meeting, 2017 (invited poster)
- “Strange conductivity of strontium titanate,” APS March Meeting, 2017 (invited)
- “Evidence for a shallow Cu acceptor in Si,” 7th International Symposium on Advanced Science and Technology of Silicon Materials (JSPS Si Symposium), 2016 (invited)
- “Strange conductivity of strontium titanate,” GRC on Defects in Semiconductors, 2016 (poster)
- “Large persistent photoconductivity in SrTiO<sub>3</sub>,” Photonics West, 2016
- “Acceptors in ZnO and SrTiO<sub>3</sub>,” ICDS-28, 2015 (invited)
- “Acceptors in ZnO: Nitrogen will not work,” APSNW Meeting, 2015 (invited)
- “Acceptor defects in ZnO and related materials,” Physical Behavior of Materials DOE-BES Contractors Meeting, 2015 (invited poster)
- “Acceptor mysteries in ZnO,” International Conference on the Physics of Semiconductors (ICPS), 2014 (invited)
- “Characterization methods,” MRS Spring Meeting, 2014 (invited tutorial)
- “Persistent photoconductivity in bulk SrTiO<sub>3</sub>,” MRS Spring Meeting, 2014
- “Persistent photoconductivity in SrTiO<sub>3</sub>,” GRC on Defects in Semiconductors, 2014 (poster)
- “Defects and persistent conductivity in SrTiO<sub>3</sub>,” ICDS-27, 2013
- “Confocal microscopy of fluids under static pressure,” APS SCCM Meeting, 2013
- “Acceptors in ZnO,” Physical Behavior of Materials DOE-BES Contractors Meeting, 2013 (invited)
- “Persistent photoconductivity in strontium titanate,” APS March Meeting, 2013

### **Student/postdoc presentations (past 10 years)**

- Cassi Remple, “Photoluminescence Spectroscopy of Cr<sup>3+</sup> in  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> and (Al<sub>0.1</sub>Ga<sub>0.9</sub>)<sub>2</sub>O<sub>3</sub>” Electronic Materials Conference (EMC), 2022 and 2023; U.S. Gallium Oxide Workshop (GOX), 2022 and 2023.
- Chris Pansegrouw, “Room-temperature persistent photodarkening in  $\beta$ -Ga<sub>2</sub>O<sub>3</sub>:Cu,” GRC on Defects in Semiconductors, 2022 (poster).
- Syeed Ahmed, “Localized phase transition of TiO<sub>2</sub> thin films induced by sub-bandgap laser irradiation,” APS March Meeting, 2021 (virtual)

- Chris Pansegrouw, “Persistent photoconductivity in barium titanate,” APS March Meeting, 2021 (virtual)
- Cassi Remple, “ $\text{Fe}^{3+}$  and  $\text{Cr}^{3+}$  photoluminescence of Fe doped  $\beta\text{-Ga}_2\text{O}_3$ ,” APS March Meeting, 2021 (virtual)
- Jacob Ritter, “Hydrogen passivation of magnesium and calcium doped  $\beta\text{-Ga}_2\text{O}_3$ ,” Photonics West, 2019
- Chris Pansegrouw, “Effect of light on hydrogen in  $\text{TiO}_2$ ,” GRC on Defects in Semiconductors, 2018 (poster)
- Jesse Huso, “Local vibrational modes and optical properties of  $\text{ZnS}_{1-x}\text{O}_x$  alloy films,” GRC on Defects in Semiconductors, 2016 (poster)
- Jacob Ritter, “Optical properties of thin film  $\text{ZnSO}$ ,” GRC on Defects in Semiconductors, 2016 (poster)
- Anya Rasmussen, “ $\text{In}_2\text{Se}_3$  phase transitions at high pressure and high temperature,” APSNW Meeting, 2015
- Xianjun Ye, “Scanning confocal microscopy using CCD and image processing,” APSNW Meeting, 2015
- Caleb Corolewski, “Lithium acceptors and hydrogen in zinc oxide,” APSNW Meeting, 2015
- Violet Poole, “On the role of point defects in the persistent photoconductivity of strontium titanate,” APSNW Meeting, 2015
- Anya Rasmussen, “Pressure-induced phase transitions in bulk and noncrystalline  $\text{In}_2\text{Se}_3$ ,” ALS User Meeting, 2014 (poster and 5 min presentation)
- Anya Rasmussen, “Pressure-induced phase transformations of  $\text{In}_2\text{Se}_3$ ,” APS SCCM Meeting, 2013
- Marianne Tarun, “Defects and room-temperature persistent photoconductivity in  $\text{SrTiO}_3$ ,” Women in Physics Conference 2013, Simon Fraser University, Burnaby, B.C. Canada, 2013

### **SEMINARS (past 10 years)**

- Oregon State University, 2023
- National Renewable Energy Lab, 2023
- University of Idaho, Physics, 2014, 2018, 2021
- Wladek Walukiewicz Symposium, UC Berkeley, 2019
- University of California Santa Barbara, Materials, 2018
- University of Utah, 2016
- University of Washington, Physics, 2015

### **EXTERNAL FUNDING (past 10 years, sole PI unless noted)**

- FuSe: Co-design of germanium oxide-based semiconductors from deposition to devices (PI: May, Drexel University), NSF, 4/1/23–3/31/25, McCluskey: \$24k
- Response of gallium oxide to pressure, temperature, and alloying (PI: McCluskey, co-PI: Bergman), DOE-BES, 6/1/22–5/31/25, \$451k (WSU: \$238k)
- Growth and characterization of photoconductive  $\beta\text{-Ga}_2\text{O}_3$  crystals (PI: Voss), DOE-LLNL, 10/1/21–9/30/24, McCluskey: \$300k
- Persistent photoconductivity in titanate semiconductor crystals, NSF-DMR, 5/1/21–4/30/24, \$397k
- Fundamentals of doping and defects in  $\text{Ga}_2\text{O}_3$  for high breakdown field electronics (PI: Scarpulla, University of Utah), DOD-Air Force, 8/1/21–9/30/24, McCluskey: \$300k

- Conference Grant – International Conference on Defects in Semiconductors, DOE-BES, 7/21/19–7/26/19, \$8k
- Conference Grant – International Conference on Defects in Semiconductors, International Union of Pure and Applied Physics (IUPAP), 7/21/19–7/26/19, €5k
- Defects in gallium oxide (PI: McCluskey, co-PI: Bergman), DOE-BES, 6/1/19–5/31/22, \$450k (WSU: \$263k)
- SBIR Phase II: Spectroscopy and imaging of irregular surfaces using confocal microscopy (PI: Lytel, Senior Personnel: McCluskey, Jokela), NSF, 8/1/18–7/31/20, \$881k
- SBIR Phase I: Spectroscopy and imaging of irregular surfaces using confocal microscopy (PI: Lytel, Senior Personnel: McCluskey, Jokela), NSF, 1/1/17–12/30/17, \$210k
- Acceptor defects in ZnO and related materials (PI: McCluskey, co-PI: Bergman), DOE-BES, 5/1/16–4/30/19, \$407k (WSU: \$263k)
- Persistent photoconductivity in strontium titanate and related oxides, NSF-DMR, 8/16/16–8/15/19, \$399k
- Acceptor defects in ZnO and related materials (PI: McCluskey, co-PI: Bergman), DOE-BES, 6/1/13–5/31/16, \$453k (WSU: \$273k)
- FRG: Structural phase transformations in polymorphic nanostructures (PI: Gu, co-PIs: McCluskey, Zhu), NSF-DMR, 7/1/12–6/30/16, \$610k (WSU: \$495k)
- Tailoring the functionality of ZnO via highly lattice mismatched and lattice matched alloying (PI: Bergman, co-PI: McCluskey), NSF-DMR, 7/1/12–6/30/15, \$432k (WSU: \$169k)
- Confocal microscopy of polymers under pressure, ACS-PRF, 9/1/11–8/31/13, \$100k
- Hydrogen in zinc oxide and related materials, NSF-DMR, 6/1/10–05/31/13, \$420k
- Optical properties of doped ZnO nanocrystals and ceramics (PI: McCluskey, co-PI: Bergman), DOE-BES, 6/1/10–5/31/13, \$453k (WSU: \$265k)

## USER ALLOCATIONS

- Response of doped gallium oxide to large pressures, high-pressure beamline 12.2.2, ALS, LBNL, 2021–22
- $\text{In}_2\text{Se}_3$  under pressure, from many layers to one, high-pressure beamline 12.2.2, ALS, LBNL, 2019–20
- Pressure induced phase transitions in crystalline and amorphous  $\text{In}_2\text{Se}_3$ , high-pressure beamline 12.2.2, ALS, LBNL, 2014–16
- Pressure-induced phase transitions in indium selenide, *CHESS beamline B2*, 2012
- Phase transformations of  $\text{In}_2\text{Se}_3$  under pressure, high-pressure beamline 12.2.2, ALS, LBNL, 2012–14
- X-ray diffraction of ZnO, MgZnO, and CdZnO under pressure, high-pressure beamline 12.2.2, ALS, LBNL, 2009–11
- Local vibrational modes of hydrogen in III-V semiconductors, National Center for Supercomputing Applications (NCSA), Startup Allocation 2008–9, Renewal 2009–10
- Zinc oxide: A material for efficient light emission, EMSL/PNNL, 2006–9

## COURSES TAUGHT

- Physics 101 (General Physics, algebra-based), 6 semesters
- Physics 102 (General Physics, algebra-based), 3 semesters
- Physics 201 (Physics for Scientists and Engineers, calculus-based), 7 semesters

- Physics 303 (Modern Physics II), 4 semesters
- Physics 410 (Electronics), 4 semesters
- Physics 443 (Optics), 2 semesters
- Physics 463 (Solid State), 6 semesters
- Physics 515 (Optoelectronics Lab), team taught, head instructor 2 semesters
- Physics 563 (Physics of the Solid State), 1 semester
- Physics 581 (Semiconductor Physics), 2 semesters
- Materials Science 571 (Surfaces), team taught, 6 semesters

## INSTRUCTIONAL INNOVATIONS

- Hands-on modules for *Physics in Your World* (Phys 150), a required course for elementary education students
- *The Physics of the Titanic*, a lecture that examines the sinking of the *RMS Titanic* from a physicist's point of view
- In-class activities for upper-division and graduate physics courses
- Thermal conductivity hands-on demonstration
- Development of new graduate course (Semiconductor Physics) and textbook
- Problem-solving textbook for algebra-based introductory physics

## STUDENT EVALUATIONS

*From 2010-2019, average instructor rating was 4.5 out of 5 ( $\sigma = 0.3$ ). Comments from students:*

- “Matthew McCluskey is by far one of the best professors I've had here. He is very clear in his teachings and extremely organized. Physics is a difficult topic, and he made it so easy to understand. Great enthusiasm as well.”
- “He was very knowledgeable about the material and was able to explain it clearly. He also did a lot of examples/practice problems during the lectures.”
- “I hated physics in HS. Detested it. This course showed me physics can be understood if it is taught well. Professor McCluskey did an outstanding job presenting the course and teaching effectively and in an enjoyable way.”
- “My favorite professor so far at WSU! Very clear and effective in lecture and was very enthusiastic about the subject!”
- “I love his sense of humor, which is something most profs lack.”
- “Course was hard, but also fun to learn about the material. He did a nice job in presenting the information in a way that was easily understandable.”

*From 1999-2009, average instructor rating was 4.4 out of 5 ( $\sigma = 0.2$ ). Comments from students:*

- “He was great, the lectures were entertaining and very informative. I learned a lot during the lectures, and his homework assignments were long, but helpful in mastering the material.”
- “WSU has the right idea with instructors like McCluskey. I'm extremely disappointed he's not teaching 202.”
- “Class participation during class is GREAT! It keeps students awake and thinking. I encourage more of those kinds of activities.”
- “The most organized professor I've seen, bar none. The lecture notes provided were one of the most useful resources I've had for any class.”

- “This has been my favorite physics course yet. Everything was straightforward, lectures were well organized, and the homeworks were relevant to class material.”

## UNDERGRADUATE RESEARCH SUPERVISION

Cody Ingraham (2023), Fiona McLary (2021), Leah Snyder (2018–21), Hannah Knaack (2015), Sonal Nanda (2014), Ben Whitfield (2013), Hillary Child (2010), Heather Ploeg (2008–10), Bobbie Riley (2006–8), Martha Roseberry (2007), Katie Epperson (2007), Andrew Ulrich (2005–6), Amy Perenchio (2005), Ben Horton (2004–5), Lance Culnane (2003), Daniel Grover (2001), Tyler Cumby (2001), Brooke Bafus (1999)

## DISSERTATIONS (Ph.D. committee chair)

- Lauren Barmore, *Photoluminescence of chromium in gallium oxide under pressure*, Physics, 2023
- Syed Ahmed, *Light induced effects in oxide semiconductors*, Mat. Sci., 2022
- Christopher Pansegrouw, *Optical phenomena in oxide semiconductors*, Physics, 2022
- Yinchuan Yu, *Machine learning in confocal microscopy and spectroscopy*, Physics, 2021
- Jacob Ritter, *Spectroscopy of defects in gallium oxide*, Physics, 2019
- Violet Poole, *Persistent photoconductivity of strontium titanate*, Physics, 2016
- Anya Rasmussen, *Pressure-induced phase transitions of indium selenide*, Physics, 2016
- Samuel Teklemichael, *Defects in ZnO nanocrystals*, Physics, 2012
- Marianne Tarun, *Hydrogen and related defects in oxide semiconductors*, Mat. Sci., 2012
- Jennifer Schei, *Optical imaging of neural and hemodynamic brain activity*, Physics, 2011
- Gabriel Hanna, *Confocal microscopy of fluid argon under pressure*, Physics, 2009
- Win Maw Hlaing Oo, *Infrared spectroscopy of zinc oxide and magnesium nanostructures*, Mat. Sci., 2007
- Slade Jokela, *Stability and structure of hydrogen defects in zinc oxide*, Mat. Sci., 2006
- Kirill Zhuravlev, *Infrared spectroscopy of conjugated organic molecules under high pressure*, Physics, 2004

## POSTDOCTORAL SUPERVISION

Christopher Pansegrouw (2022–), Jesse Huso (2016–19), Violet Poole (2016–18), Xianjun Ye (2013–17), Samuel Teklemichael (2012–13), Marianne Tarun (2012–13), Gabriel Hanna (2010), Slade Jokela (2008–9), Win Maw Hlaing Oo (2007–9), Hongying Peng (2001–3)

## PRESS CITATIONS / QUOTATIONS (past 10 years)

- Creating a Microscope*, IREO podcast (Episode 23), 4/20/2022  
<https://research.wsu.edu/innovation/ireo-podcast/>
- Physicist honored for microscope invention, impact on society*, WSU Insider, 2/11/2022  
<https://news.wsu.edu/news/2022/02/11/physicist-honored-for-microscope-invention-mentoring-impact-on-society/>
- WSU startup receives research grant*, WSU Insider, 9/18/2018  
<https://news.wsu.edu/2018/09/18/wsu-startup-receives-research-grant/>
- Writing with Light: An ‘Etch A Sketch’ Electrical Circuit*, Tech Briefs, 8/3/2017  
<http://www.techbriefs.com/component/content/article/1198-ntb/news/news/27358-writing-with-light-an-etch-a-sketch-electric-circuit>
- WSU physicists write with light, turn crystal into an electrical circuit*, WSU Today, 7/27/2017

<https://news.wsu.edu/2017/07/27/wsu-physicists-write-light-turn-crystal-electrical-circuit/>

- *Building a better microscope*, The Daily Evergreen, 1/17/2017  
<https://dailyevergreen.com/6413/news/building-a-better-microscope/>
- *Seeing discoveries through clear eyes*, Moscow/Pullman Daily News, 1/14/2017
- *Need for a better microscope prompts launch of a startup*, WSU Today, 1/12/2017  
<https://news.wsu.edu/2017/01/05/need-better-microscope-prompts-launch-startup/#more-153451>
- *Ask Dr. Universe*  
<https://askdruniverse.wsu.edu/2016/10/31/how-do-cats-land-on-their-feet/>  
<https://askdruniverse.wsu.edu/2015/09/28/why-is-space-so-cold/>  
<https://askdruniverse.wsu.edu/2015/03/09/drifting-out-to-space/>
- *Can open access publishing be a smart career move?*, New Scientist issue 2983, 8/26/2014  
<http://www.newscientist.com/article/dn26101-can-open-access-publishing-be-a-smart-career-move.html>
- *Scientist of the Week: Matthew Mccluskey*, Laboratory Equipment, 12/5/2013  
<http://www.laboratoryequipment.com/news/2013/12/scientist-week-matthew-mccluskey>
- *Accidental discovery dramatically improved conductivity*, WSU Today, 11/14/2013  
<https://news.wsu.edu/2013/11/14/accidental-discovery-dramatically-improves-electrical-conductivity/#.VT-43iFVhBd>

## VIDEOS

- *WSU Physics Dept. make accidental discovery that could help advance technology*, 2013  
<http://www.klewtv.com/news/local/WSU-students-make-accidental-discovery-that-could-help-advance-technology-232665501.html>
- *Accidental discovery dramatically improves electrical conductivity*, 2013  
<http://www.youtube.com/watch?v=WlcpzLbSzrY>
- *Ice in oil: A disappearing act*, 2011  
<http://youtu.be/SKG46jJyL30>
- *Ice VI*, 2008  
<http://www.youtube.com/watch?v=VLuQoNhVv3U>
- *Watermelon versus liquid nitrogen*, 2007  
<http://www.youtube.com/watch?v=szBafBoN2nY>