John S. McCloy, PhD

Curriculum Vita (summary)

Washington State University, School of Mechanical & Materials Engineering
PO Box 642920, Pullman, WA 99164-2920
509-222-8442 (mobile), 509-335-7796 (work)
john.mccloy@wsu.edu; jsmccloy@alum.mit.edu; http://john.mccloy.info/index.html

Present Employment

Washington State University (WSU), Pullman, WA (7/13 – present)
Professor, Materials Science & Engineering
Lindholm, Herman & Brita Endowed Chair in Materials Engineering
School of Mechanical and Materials Engineering, College of Engineering & Architecture
Other concurrent appointments

- *Director,* **School of Mechanical and Materials Engineering**, WSU (2022-)
- *Affiliate Faculty*, Department of Chemistry, WSU (2016-)
- *Affiliate Faculty*, Department of Physics and Astronomy, WSU (2021-)
- *Affiliate Faculty*, PNNL-WSU Institute for Nuclear Science & Technology (INST), WSU (2016-)
- *Chief Scientist*, joint appointee, PNNL Reactor Materials group (2023-)

Previous Positions

- **WSU,** *Director*, Institute of Materials Research (2/20-6/22)
- **WSU**, *Director*, Material Science & Engineering Program (1/17-2/20)
- **WSU**, *Affiliate Faculty*, Materials Science & Engineering Program, WSU (2013-2022)
- **PNNL**, Chief Scientist, joint appointment, Radiological materials group (2015-2023)
- **Institut de Physique du Globe de Paris (IPGP), Université de Paris, France** (5/19-6/19 ; 6/2023-7/2023), *Visiting Professor and Researcher,* Equipe Géomatériaux
- **University of Sheffield, United Kingdom** (11/15-12/19), *Visiting Professor of Nuclear Materials*, Dept. of Materials Science & Engineering
- **Frumpkin Institute of Physical Chemistry and Electrochemistry, Russian Academy of Sciences, Russian Federation** (2018), *Honorary Professor*
- **Pacific Northwest National Laboratory (PNNL), Richland, WA** (6/08 – 7/13)
  Senior Research Scientist (S&E IV) and Team Leader
  Glass and Materials Team, Radiological Materials & Technology Development Group, Radiological & Nuclear Division, Energy & Environment Directorate
- **Raytheon Missile Systems, Tucson, AZ** (5/00 – 5/08)
  Senior Mechanical Engineer II (E04) with Honors
- **Crane Interpoint, Redmond, WA (1/98- 9/99)**
  Process Engineer II

Education

- Ph.D. Material Science & Engineering, (May 2008)

Department of Materials Science & Engineering, University of Arizona, Tucson, AZ

- M.S. Material Science & Engineering, (May 2007)

Department of Materials Science & Engineering, University of Arizona, Tucson, AZ

- M.A. Cultural Anthropology, (May 2004)

School of Anthropology, University of Arizona, Tucson, AZ

- S.B. Materials Science & Engineering, (June 1996)

Department of Materials Science & Engineering, Massachusetts Institute of Technology

Research Interests

Advanced ceramic and metallic materials; advanced material characterization methods; electronic materials characterization; glasses, ceramics, glass-ceramics for nuclear waste immobilization; crystal growth of oxide and chalcogenide semiconductors; structure–property relationships in glasses; magnetic oxide ceramics; magnetic characterization methods; infrared-transmitting ceramics; radiation effects in materials; historical development of materials technologies

INPRIA EX2002
Lam Research Corp. v. Inpria Corp.
IPR2024-00033

Awards/Honors

- **WSU College of Engineering Anjan Bose Outstanding Researcher Award, 2020**
- **Fulbright Scholar, US Department of State and US-UK Commission, 2019**
- **Fellow, American Ceramic Society, 2018**
- **Richard M. Fulrath Award (Fulrath-Okazaki), American Ceramic Society, 2018**
- Invited delegate to National Academy of Engineering symposia, 2013, 2015
- Graduate of Provost Leadership Academy, WSU, 2019
- WSU Outstanding Teacher, 2016; WSU Outstanding Researcher, 2018
- SPIE Senior member, 2015; Sigma Xi Full member, 2010
- Inductions: Order of the Engineer, 2013; Keramos, 2007
- Adjunct faculty member, Washington State University, Tri-Cities, 2011-2013
- PNNL Scientist & Engineer Development Program, 2010-2011
- Peer-voted "with Honors" designations at Raytheon, 2005, 2007

Professional Service

- American Ceramic Society –Editorial Board for Ceramics Bulletin (2016), Division Chair (2018)
- SPIE – Society of Photo-optical Instrumentation Engineers, symposia organizing committee
- Sigma Xi – Scientific Research Society, Chapter Vice-President (2011-2013)
- Other memberships (*current*): *AAAS, MRS*, *MSA*, *SGT, ACS, AACG, ASME*
- Organizing committee, symposium chair, session chair for various meetings
- Referee for >50 different international journals

Research Publications

- International peer-reviewed journal articles: 196
- Books: 1; Book chapters: 5
- Conference proceedings papers: 30
- Technical reports (public): 35
- Patents: 3
- **H-index = 35**; i10-index = 119; >5100 citations (since 2013).

Presentations

- Conference oral presentations: >100 (**in 10 different countries**)
- Invited talks (public): >50

Supervisor

- Department chair for ~40 professors and ~10 staff (2022-present)
- Major supervisor for grad./undergrad./post-doc research (current group ~20) at WSU (2013 –)
- Graduated **17 PhDs and 3 MS** students from WSU (2013 –)
- Team lead for 17 research staff and students at PNNL (2010 – 2013)

Teaching Experience

- WSU courses: Materials Laboratory; Materials Engineering; Electronic Materials; Ceramic Materials; Glass Science & Technology; Advanced Materials Science; Materials Design
- Raytheon course: Infrared Materials and Dome Design

Citizenship

- United States of America

JOHN S. McCLOY, PhD

CONTACT INFORMATION

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http://www.mme.wsu.edu/people/faculty/faculty.html?mccloy
https://materials.wsu.edu/person/john-mccloy/
http://www.researchgate.net/profile/John_Mccloy/
http://john.mccloy.info/index.html
http://labs.wsu.edu/mccloy/
https://materialsresearch.wsu.edu/our-team/
http://www.linkedin.com/pub/john-mccloy/33/26/773

SUMMARY

Highly adaptive scientist & engineer with 10 years of industry experience in microelectronics/ aerospace/ defense, 5 years in national laboratory, and 9 years in academic teaching/ research/ administration. Endowed Professor of Materials Science & Engineering (MSE) and **current Director (Department Chair) of the School of Mechanical and Materials Engineering** at Washington State University, with ~$7M annual budget.

Roles held in personnel and technology management, research and development, engineering and manufacturing. Worked in operations, test, and design organizations, and led multi-disciplinary project teams of >20 in both manufacturing and engineering R&D. **Experienced project manager and director** with typical >$1M R&D expenditures per year. Performed business development, client interaction, proposal writing, presentation, and technology roadmap planning. Worked technology management side with government labs, strategic partners, sponsored university projects, international collaborations, and intellectual property licensing.

Independent, quick learner with excellent planning, organizational, research, mentoring and teaching, presentation, and technical writing skills. Diverse technical experience, analytical capability, and topical interest. Technical training in materials science and engineering and anthropology. Performed field work in a technology company in occupational and corporate culture. Special interest in **solid state chemistry/physics and spectroscopy**, particularly of inorganic materials. Materials science focus in **ceramics and glasses**, particularly for nuclear applications. Current research focusing on structural and chemical disorder in materials and resulting novel properties. Started **Nuclear, Optical, Magnetic, & Electronic (NOME) Materials Laboratory** at Washington State University in 2013. Former director of MSE PhD program and of the Institute of Materials Research, focusing on **crystal growth of semiconductors**. Produced **>250 publications** (journal articles, book, conference papers, public reports, patents) and >130 public presentations at scientific conferences in 10 countries.

EDUCATION

Ph.D., Material Science & Engineering, University of Arizona, May 2008 (GPA 4.0/4.0)

- Dissertation: "Processing and Properties of Chemical Vapor Deposited Zinc Sulfide" http://arizona.openrepository.com/arizona/handle/10150/194010?mode=simple
- Dissertation research included: materials processed via chemical vapor deposition and hot isostatic pressing; characterization by spectroscopy including UV-VIS spectrometry, FTIR, Raman, and Photoluminescence; microscopy including SEM (with EDS), TEM, and metallographic techniques; and ab initio investigation of electronic and vibrational properties. Dissertation resulted in a book from SPIE Press.

M.S., Materials Science & Engineering, University of Arizona, May 2007 (GPA 4.0/4.0)

- Concentrations: Optical (Photonic) Materials, Laser Materials, Electronic Materials
- Courses & research included: Solid State Optics, Physics of Solid-State Laser Materials, Materials Characterization, Optical Spectroscopy, Computational Methods in Materials Science, Kinetics, Chemical Thermodynamics, Optical & Electronic Materials, Biological & Synthetic Materials, Technology of Polymers & Ceramics, Mechanical Properties of Materials

M.A., Anthropology, University of Arizona, May 2004 (GPA 4.0/4.0)

- Concentrations: Cultural Anthropology, Industrial Anthropology, Medical Anthropology (Certificate)
- Thesis: "Corporate and Occupational Culture in a Southwest Defense Company"
- Courses & research included: Ethnomedicine, Science & Society, Sociolinguistics, Anthropology & International Health, Risk & Society, Human Factors & Ergonomics, History & Theory in Anthropology, Applied Medical Anthropology, Human Subjects & Institutional Review Board, Anthropology of Work

B.S., Materials Science & Engineering, Massachusetts Institute of Technology, June 1996 (GPA 4.8/5.0)

- Concentrations: Ceramics; Archaeology/Anthropology (Minor)

EXPERIENCE

Washington State University (WSU), Pullman, WA (7/13 – present)

Lindholm, Herman & Brita Endowed Chair in Materials Engineering, 2020-
Professor, 2018-

Associate Professor, 2013-2018

School of Mechanical & Materials Engineering (MME), College of Engineering & Architecture
http://www.mme.wsu.edu/people/faculty/faculty.html?mccloy
http://labs.wsu.edu/mccloy/

- **Concurrent appointments**
  - **Director, School of Mechanical & Materials Engineering, WSU (July 2022-)**
  - Director, Institute of Materials Research, WSU (Feb 2020-June 2022)
    https://materialsresearch.wsu.edu/our-team/
  - Director, Materials Science & Engineering Program, WSU (2017-Jan 2020)
  - Chief Scientist, joint appointment, Pacific Northwest National Laboratory (2015-)
    http://rmtd.pnnl.gov/staff/staff_info.asp?staff_num=1724
  - Visiting Professor of Nuclear Materials, Dept. of Materials Science & Engineering, University of Sheffield, UK (2015-2019)
  - Affiliate Faculty, Materials Science & Engineering Program, WSU (2013-)
    https://materials.wsu.edu/person/john-mccloy/
  - Affiliate Faculty, Department of Chemistry, WSU (Jan 2016-)
  - Affiliate Faculty, Department of Physics and Astronomy, WSU (Nov 2021-)
  - Affiliate Faculty, Institute for Nuclear Science & Technology (INST), WSU (2016-)

MANAGEMENT/ ADMINISTRATION

Responsibilities, Director School of Mechanical and Materials Engineering (MME), 2022-present

- Primary unit leader for ~40 faculty (including ~30 tenure/tenure track) and ~10 staff members
- Developed department vision and structure; appointed committees and leaders; conducted meetings
- Managed department budget, front office staff
- Appointed advisory board of industry and alumni; conducted meetings; engaged in fundraising
- Conducted performance, tenure, and promotion reviews; led faculty development and mentoring
- Attended college-level meetings; negotiated budgets
- Spearheaded hiring of 4 new faculty members; spearheaded integration of PhD program and collaboration with branch campuses

Responsibilities, Director Institute of Materials Research (IMR), 2020-2022

- IMR is an independent department focusing on research mission; some recurring state support
- Took over large operation when former faculty passed away suddenly; successfully transitioned projects, completed deliverables, graduated students, captured considerable amount of new project funding
- Managed research professors and associates, lab manager, and finance/budget coordinator, including providing budgets and annual reviews
- Responsible for operations and safety in 13 laboratory spaces with multiple hazards from materials synthesis and characterization equipment
- Performed budget planning for equipment and laboratory upkeep, as well as project execution
- Wrote proposals for equipment and R&D projects; report as required for these projects
- Hired staff, faculty, and students to support IMR projects
- Communicated long-term vision and strategy to team; developed website content
- Mentored students and staff in research methods and administration
- Reported to dean of engineering

Responsibilities, Director Materials Science & Engineering PhD Program (MSEP), 2017-2020

- Reported to 3 deans: Graduate School, College of Engineering & Architecture, College of Arts & Sciences
- Managed one Program Administrative Assistant
- Managed graduate student PhD population of ~55 students, ensuring all student-related functions of program are fulfilled, including onsite recruiting, annual student evaluation, awards, retention, and administration
- Responsible for budget used in recruiting, assistantships, and student activities; perform allocation of available resources for research and teaching assistantships (RAs and TAs) every semester
- Managed faculty appointments to MSEP from 6 departments; convene regular meetings of the MSEP faculty and the MSEP advisory committee; appoint committee members to various MSEP committees
- Organized and run the MATSE 593 graduate seminar, inviting speakers and coordinating visits
- During appointment, made the following improvements: improved flexibility of curriculum and streamlined course transfer policy, instituted regular communication with faculty and alumni, compiled demographics on program recruiting and retention, revitalized graduate seminar format, updated learning outcomes and assessment plan, worked towards sustainable funding model for MSEP with senior administration

Laboratories

- NOME – Nuclear Optical Magnetic and Electronic materials group
  - Glass melting and ceramic synthesis (ETRL 322, 326)
  - Spectroscopy (ETRL 345)
  - Magnetic materials (ETRL 151)
  - X-ray diffraction (ETRL 206)
  - Actinide ceramics synthesis (ETRL 328)
- CASC – Crystals And SemiConductors group
  - X-ray nano computed tomography (ETRL 016)
  - Microelectronics cleanroom and Czochralski crystal growth (ETRL 002)
  - Synthesis and crystal growth lab (ETRL 042)
  - Bridgman crystal growth and chemical processing lab (ETRL 242)
  - Bridgman crystal growth lab 2 (Dana 10)
  - Radiation detector characterization lab (EME B6)
  - Decommissioning existing lab (TF 111)

TEACHING

Washington State University (2013 –present)

- Full courses
  - ME220: Materials Laboratory (Fall 2018): to 160 students (Spring 2018): to ~150 students
  - MSE201: Materials Science (Fall 2015, Fall 2016, Spring 2020) to 110-120 undergraduate engineering students, primarily in Mechanical Engineering and Materials Engineering
  - MSE302: Electronic Materials (Fall 2013, Fall 2014, Fall 2021) to 100-120 (2013,2014) or 27 (2021) undergraduate engineering students, in Chemical, Electrical, & Materials Engineering
  - MSE318: Materials Design (Spring 2023) to ~15 students; new course
  - MSE403: Ceramic Materials (Spring 2014, Spring 2017, Spring 2018, Spring 2021) to 30-50 undergraduate engineering students, primarily in Materials Engineering and Mechanical Engineering
  - MSE425: Senior Thesis (Fall 2023) to 2 undergraduate students
  - MSE503/MSE534: Special Topics: Glass Science & Technology (Spring 2015) to 10 graduate students; (Spring 2016) to 3 online graduate students; (Fall 2018) to 11 graduate students; (Spring 2022)
  - MSE503: Special Topics: Radioactive Waste Management (Spring 2023) to 3 students
  - MSE505: Advanced Materials Science (Fall 2020) to 25 graduate students

- MSE593: Materials Science & Engineering Program Seminar (Fall 2017, Spring 2018, Fall 2018); organized all seminars

- Guest lecturer
  - MSE110: Introduction to Materials Science: (Fall 2013) Magnetic materials; (Fall 2014/2015/2016/2017/2019) Glass science; Ceramics & Nuclear (Fall 2020)
  - MSE323: Materials Characterization Laboratory (Spring 2015) X-ray diffraction
  - MSE523: Ceramics Processing (Spring 2016) Glasses & ceramics for nuclear waste
  - MSE571: Materials Characterization (Spring 2014 & 2015) Electrical and magnetic measurements; (Spring 2024) Raman spectroscopy
  - MSE503: Special topics: Nanotechnology (Spring 2016) Nanomagnetics
  - MSE593: Materials Science & Engineering Seminar (Fall 2016, 2017, 2020, 2022)
  - ME466: Fundamentals of Engineering Examination Review (Spring&Fall 2016) Materials science
  - PHYS563: Semiconductors (Fall 2018) Device physics
  - CHEM550: Nuclear Fuel Cycle (Fall 2016) Nuclear Waste Management
  - MUS163: World Music (Spr 2019, 2020) Digeridoo

Raytheon Missile Systems, Tucson, AZ (2004 –2008)

- Developed and annually taught 12-hour course entitled "Infrared Materials and Dome Design" aimed at all disciplines of engineers including lectures on system engineering of infrared domes and windows, environments, optics and electromagnetics, thermo-mechanical design, oxide ceramics, semiconductors, glasses and polymers, and materials processing and coating technologies.

Massachusetts Institute of Technology, Cambridge, MA (1996-1997)

- Department of Materials Science and Engineering. Section lecturer and grader for "Introduction to Solid State Chemistry." Lab teaching assistant for Materials Processing Lab. Guest lecturer in Mesoamerican Archaeology.

STUDENTS

Post-doctoral students, visiting scholars, and staff scientists supervised (*current*)

1. Dr. Deepak Patil: 2016 – 2018; Current: Research associate at UCLA
2. Dr. Jason Lonergan: 2016 – 2018; Current: Research professor at Missouri Univ. of Sci. & Techn.
3. Dr. Hua Chen: 2018 – 2019; Current: Prof. Inner Mongolia University of Science & Techn., China
4. Dr. José Marcial: 2018; Current: Staff Scientist at PNNL
5. Dr. Travis Olds: 2017 – 2019; Current: Curator of Mineralogy at Carnegie Museum Pittsburgh
6. Dr. Mostafa Ahmadzadeh: 2019 – 2020; Current: Materials Science Consultant at Exponent
7. Dr. Rubi Gul: 2020 – 2022; Crystal grower at commercial company
8. Dr. Magesh Murugesan: 2021 – 2022; Post-doctoral Research Associate WSU
9. *Dr. Marc Weber: 2020 – PRESENT; Research Associate WSU*
10. *Dr. Phil Himmer: 2021 – PRESENT; Research Laboratory Manager/ Assistant Research Professor WSU*
11. *Dr. Santosh Swain: 2020 and 2022 – PRESENT; Research Assistant Professor at WSU*
12. *Dr. Sam Karcher: 2022 – PRESENT; Post-doc WSU*
13. *Dr. Malin Chris Dixon Wilkins: 2022 – PRESENT; Post-doc WSU*
14. Jack S. Clarke, University of Sheffield, UK, 2017, PhD Intern
15. Aya Azeddioui, University of Montpellier, France, 2023, MS intern

Graduated MS students, primary advisor

1. Junghune Nam (Advisor, **MS**, Materials Science & Engineering, 2016): 2015 – 2016, "Aqueous Synthesis of Iodide Sodalite for the Immobilization of I-129," Dec. 2016; Current: Materials Engineer at Ascend Elements
2. Josiah Lere-Adams (Advisor, **MS**, Materials Science & Engineering, 2020): 2019 – 2020, "Magnetic Glass Ceramics: A Study of Hexaferrites in the Strontium Borate Glass System," May 2021; Current: PhD student at WSU

3. Samuel Bigbee-Hansen (Advisor, **MS**, Materials Science & Engineering, 2022): 2020 – 2022, "Cadmium Telluride: A Study on the Effects of Iodine Doping" June 2022; Current: engineer at Hexcel

Graduated PhD students, primary advisor

1. Jamie Weaver (Co-advisor: **PhD**, Chemistry, 2016): 2013 – 2016, "Localized Chemistry of ^{99}Tc In Simulated Low Activity Waste Glass," Dec. 2016; Current: Staff research chemist at NIST
2. Brian Riley (Advisor, **PhD**, Materials Science & Engineering, 2017): 2015 – 2017 "Aluminosilicates for the Capture and Immobilization of High-Halide Wastes from Used Nuclear Fuel Reprocessing," July 2017; Current: Staff scientist at PNNL
3. Ke Xu (Advisor: **PhD**, Materials Science & Engineering, 2017): 2013 – 2017, "Correlation Between Irradiation Damage and Micromagnetic Properties for Reactor Steels," Dec. 2017; Current: Sr. Applications engineer at ASML
4. Yue Cao (Advisor: **PhD**, Materials Science & Engineering, 2017): 2013 – 2017, "A Study of Magnetic Non-Destructive Evaluation for Degradation Detection in Nuclear Steels," Dec. 2017; Current: Sr. Competence Engineer at ASML
5. José Marcial (Advisor: **PhD**, Materials Science & Engineering, 2017): 2014 – 2017, "Compositional Dependence of Glass Corrosion Due to the Crystallization of Nepheline," Dec. 2017; Current: Staff scientist at PNNL
6. Saehwa Chong (Advisor, **PhD**, Materials Science & Engineering, 2017): 2014 – 2017, "Characterization of Sodalite Based Waste Forms for Immobilization of ^{129}I," Dec. 2017; Staff scientist at PNNL
7. Mostafa Ahmadzadeh (Advisor, **PhD**, Materials Science & Engineering, 2019): 2015 – 2019, "Systematic Investigation of Effects of Iron on Crystallization of Iron-Containing Sodium Aluminosilicate Glasses," May 2019; Current: Materials Science Consultant at Exponent
8. Muad Saleh (Co-advisor, **PhD**, Materials Science & Engineering, 2019): 2016 – 2019, "Characterization and Optimization of Dopants, Impurities, and Defects in Bulk Optical and Semiconductor Materials ZnS, β-Ga_2O_3, and Nd:YAG," Dec. 2019; Current: Product Engineer at Lam Research
9. Emily Nienhuis (Advisor, **PhD**, Materials Science & Engineering, 2020): 2016 – 2020, "Structure of Glasses and Glass-Forming Liquids with Application to Nuclear Waste Vitrification," May 2020; Current: Staff Chemist at PNNL
10. Saketh Kakkireni (Co-advisor, **PhD**, Mechanical Engineering, 2020): 2020, "Strategies and Challenges to Improve Single Crystal Yield and Detector Properties of CdZnTe via Accelerated Crucible Rotation," July 2020; Current: Research engineer at Redlen, Inc.
11. Sam Karcher (Co-advisor, **PhD**, Materials Science & Engineering, 2021): 2017 – 2021, "Influence of Rare-Earth Doping and Irradiation on the Defects and Microstructure of Uranium Oxide Spent Nuclear Fuel Analogues," Dec. 2021; Current: Post-doc at WSU
12. Michael Kindle (Co-advisor, **PhD**, Materials Science & Engineering, 2021): 2017–2021, "Glass And Crystalline Vanadium Oxides for Use as Positive Electrodes In Lithium And Zinc Metal Batteries," Dec. 2021; Current: Post-doc at PNNL
13. Matthew Athon (Advisor, **PhD**, Materials Science & Engineering, 2022): 2018-2022, "Fundamental Studies on the Morphology and Effects of Uranium Carbide Particles During Casting in Uranium and U-10Mo Metal," May 2022; Current: Staff scientist at PNNL
14. Steven Luksic (Advisor, **PhD**, Materials Science & Engineering, 2022): 2016-2022, "X-Ray Computed Tomography and Modeling of Glass Melts," May 2022; Current: Staff scientist at PNNL

15. David Bollinger (Advisor, **PhD**, Materials Science & Engineering, 2022): 2018 –2022, "Materials Synthesis and Characterization for Waste Valorization and Nuclear Waste Containment" June 2022; Current: administrator at WSU
16. Natalie Smith-Gray (Advisor, **PhD**, Materials Science & Engineering, 2022): 2018 –2022, "Analysis of Simulated Nuclear Waste Glass on Sulfur Solubility and Refractory Corrosion" June 2022; Current: assistant professor at Walla Walla University
17. Jani Jesenovec (Advisor, **PhD**, Materials Science & Engineering, 2022): 2018 –2022, "Doping and Alloying of Monoclinic β-Ga_2O_3 Grown by Czochralski and Vertical Gradient Freeze" July 2022; Current: crystal grower at BAE Systems

Graduate students, primary advisor, current

- PhD Students, Primary Advisor, current
    1. Julio Zamora (Co-advisor, PhD student, Materials Science & Engineering): 2019 –
    2. Josiah Lere-Adams (Advisor, PhD student, Materials Science & Engineering): 2021 –
    3. Corey Halverson (Co-advisor, PhD student, Physics): 2021 –
    4. Jing Shang (Advisor, PhD student, Materials Science & Engineering): 2021 –
    5. Jonathan Evarts (Co-advisor, PhD student, Materials Science & Engineering): 2021 –
    6. Ben Dutton (Advisor, PhD student, Materials Science & Engineering): 2021 –
    7. Nabil Shuvo (Advisor, PhD student, Chemistry): 2023 –
    8. Maddison Heine (Advisor, PhD student, Materials Science & Engineering): 2023 –
- MS Students, Primary Advisor:
    1. Joseph Tallan (Advisor, MS student, Materials Science & Engineering): 2023 –

Graduate Students, Committee member, past and current (WSU unless otherwise noted)

- MS students - past
    1. Chad Nixon (Committee: **MS**, Materials Science & Engineering, 2014): 2013 –14
    2. Steven Luksic (Committee: **MS**, Chemistry, 2015): 2015
    3. Saketh Kakkireni (Committee: **MS**, Mechanical Engineering, 2016): 2016
    4. Karun Kalia (Committee: **MS**, Materials Science & Engineering, 2016): 2016
    5. Kjell Westra (Committee: **MS**, Mechanical Engineering, 2019): 2019
    6. Kyle Kriegsman (Committee: **MS**, Chemistry, 2022): 2020-22
    7. Jesse Lang (Committee: **MS**, Environmental Science): 2022 - 23

- PhD students - past
    8. Jake Fisher (Committee: **PhD**, Mechanical Engineering, 2015): 2015
    9. S.M. Golam Mortuza (Committee: **PhD**, Mechanical Engineering, 2016): 2015 – 2016
    10. Peter Dickens (Committee: **PhD**, Materials Science & Engineering, 2016): 2014 – 2016
    11. Craig Owen (Committee: **PhD**, Materials Science & Engineering, 2017): 2017 – 2017
    12. Jedidiah McCoy (Committee: **PhD**, Materials Science & Engineering, 2018): 2014 – 2018
    13. Joelle Reiser (Committee: **PhD**, Chemistry, 2018): 2015 – 2018
    14. Stephanie Thornber (External examiner: **PhD**, Materials Science & Engineering, 2018, University of Sheffield, United Kingdom)
    15. Hrishikesh Kamat (Committee: **PhD**, Materials Science & Engineering, Rutgers, 2021): 2019 – 2021
    16. Doug Reid (Committee: **PhD**, Mechanical Engineering, 2022): 2020 – 2022
    17. Xinyi Xu (Committee: **PhD**, Materials Science & Engineering, Rutgers, 2022): 2021 – 2022

18. Yingcheng Zhang (Committee: **PhD**, 2023, Materials Science & Engineering, Rutgers): 2021 – 2023
19. Syeed Ahmed (Committee: **PhD**, Materials Science & Engineering, 2022): 2020 – 2022
20. Nikhila Balasubramanya (Committee: **PhD**, Materials Science & Engineering, Rutgers, 2022): 2020 – 2022
21. Andrew Strzelecki (Committee: **PhD**, Materials Science & Engineering, 2022): 2020–2022
22. David Koch, (Committee: **PhD**, Mechanical Engineering, 2023): 2021 – 2022
23. Vitaliy Goncharov (Committee: **PhD**, Materials Science & Engineering, 2023): 2021–2023
24. Lauren Barmore (Committee: **PhD**, 2023, Physics): 2021 – 2023

- MS students - current

- PhD students - current
    1. Xiaodong Xiao (Committee: PhD student, Chemistry): 2022 –
    2. Shinhyo Bang (Committee: PhD student, Chemistry): 2022 –
    3. Natalie Yaw (Committee: PhD student, Chemistry): 2022 –
    4. Brynn Merrill (Committee: PhD student, Chemistry): 2023 –
    5. Emma Carlsen (Committee: PhD student, Chemistry): 2023 –
    6. Matthew Heaney (Committee: PhD student, Chemistry): 2023 –
    7. Peter Jensen (Committee: PhD student, Chemistry): 2023 –
    8. Cassandra Remple (Committee: PhD student, Materials Science & Engineering): 2020 –
    9. Muqiao Su (Committee: PhD student, Materials Science & Engineering): 2022 –
    10. Juejing Liu (Committee: PhD student, Materials Science & Engineering): 2023 –
    11. Jordan Barr (Committee: PhD student, Materials Science & Engineering): 2023 –
    12. Shaw Su (Committee: PhD student, Chemical Engineering): 2023-
    13. Julie Miller (Committee: PhD student, Physics): 2023-

Undergraduate theses

1. José Marcial (**BS**, Materials Science & Engineering, 2013): 2013, "Compositional Dependence of Glass Corrosion due to Formation of Nepheline"
2. Joey Kabel (**BS**, Materials Science & Engineering, 2015): 2014–2015, "Compositional Dependence of Crystallization in Lithium Aluminosilicate Glasses"
3. Jimmy Wolfram (**BS**, Materials Science & Engineering, 2015): 2015, "Characterization of Nepheline in Iron Doped Sodium Aluminosilicate Glasses"
4. Muad Saleh (**BS**, Materials Science & Engineering, 2015): 2013–14, "Effects of Heat Treatment of Nuclear Steel on Magnetic Barkhausen Noise"
5. Erik Fergerstrom (**BS**, Materials Science & Engineering, 2017): 2016–17, Glass technology and use in ancient Byzantine Turkey: color, composition, deterioration, and field identification of glass at Çadir Höyük"
6. Mahmood Abusamha (**BS**, Materials Science & Engineering & Mechanical Engineering, 2017): 2016-17, "Vitrified Hillfort Melting"
7. Joanna Mader (**BS**, Materials Science & Engineering, 2017): 2017, "Characteristic Analysis of Low Melting Salt Phases in Relation to Nuclear Waste Glass"
8. Nicklaus Jones (**BS**, Materials Science & Engineering, 2018): 2017, "Effect of Boron to Alkali Ratio on Alumina-Borosilicate Glass-Ceramics for Nuclear Waste Immobilization"
9. Jonathan Moore (**BS**, Materials Science & Engineering, 2019): 2017–2019, "Synthesizing Greigite Nanoparticles via a PVP-Assisted Hydrothermal Synthesis"

10. Maddison Heine (**BS**, Materials Science & Engineering, 2019): 2018–2019, "Melting and Structural Analysis of Phosphate Glass-Ceramics for Energy Storage"
11. Gabe Cocking (**BS**, Materials Science & Engineering, 2019): 2017–2019; "The Introduction of 4+ Cations in Nepheline Glasses"
12. Seth McPherson (**BS**, Materials Science & Engineering, 2020): 2020, "Investigation of In-Situ Doped High Pressure Bridgman CdTe Material on Thin-Film Device Properties"
13. Michael Forbes (**BS**, Materials Science & Engineering, 2020): 2020, "Annealing of UV Filters"
14. Jessica Erickson (**BS**, Materials Science & Engineering, 2022): 2019-2022, "Lithium-Iron Silicate Glasses as Simulations of High-Fe Nuclear Waste Glass"
15. Evan Mellish (**BS**, Materials Science & Engineering, 2021): 2021, "Influence of Annealing on Tellurium inclusions of Cl-doped Cadmium Telluride"
16. José Madrigal (**BS**, Materials Science & Engineering. 2022): 2022, "Uranium oxide doping"
17. Kevin Grogan (**BS**, Materials Science & Engineering, 2022): 2022 "Interactions in the $Ga_xB_{2-x}O_3$ ($0 \leq x \leq 1$) System at Elevated Temperatures"
18. Brooke Downing (**BS**, Materials Science & Engineering, 2023): 2020–2023, "Iridium Related Impurities during β-Ga_2O_3 Crystal Growth and the Development of a Novel Crucible Material"
19. Halen Harvey Walker (**BS**, Materials Science & Engineering, 2023): 2021–2023 "The Photoplastic Effect in β-Ga_2O_3"
20. Cuter Starr (**BS**, Materials Science & Engineering, 2023): 2022-2023 "Growth and Examination of $(Bi_{1-x}Sb_x)Te_3$"
21. Edward Noriega (BS candidate, Materials Science & Engineering): 2023 "Manufacturing polycrystalline Y_2O_3 and CeO_2 ceramics for use as IR windows"

<u>Other undergraduate research supervised</u>

22. Jacob Peterson (**BS**, Chemical Engineering, 2015): 2014 - 15
23. Cassandra Steffen (**BS**, Civil Engineering, 2017): 2015 - 2017
24. Emily Allen (**BS**, Mechanical Engineering, 2018): 2017
25. Joseph Osborn (**BS**, Management & Information Sciences, 2018): 2015 - 2017
26. Zayne Nelson (**BS**, Civil and Environmental Engineering, 2020): 2017
27. Parker Toews (**BS**, Mechanical Engineering, 2021): 2020 – 2021
28. Jasdeep Singh (**BS**, Mechanical & Materials Science & Engineering, 2021): 2020 – 2021
29. Nathan Shine (**BS**, Data Analytics): 2021
30. Julia Esakoff (**BS**, Earth Sciences, 2022): 2021 – 2022
31. Sophia Rubero (**BS**, Chemical Engineering, 2022): 2021
32. Shella Crafton (Materials Science & Engineering): 2022
33. Connor Reschke (Materials Science & Engineering): 2023
34. Ravi Lin (Materials Science & Engineering, Case Western University): 2023
35. Ian Wells (**BS**, Mechanical Engineering, 2023): 2022 – 2023
36. John Bussey (Materials Science & Engineering): 2020 –
37. Raine Antonio (Materials Science & Engineering): 2021 –
38. Nathan Sakaguchi (Materials Science & Engineering): 2022 –
39. Audra Totten (Materials Science & Engineering): 2023 –
40. John Pittman (Materials Science & Engineering): 2023 –
41. Josie Soles (Materials Science & Engineering): 2023 –

SERVICE

University Service

- Director, School of Mechanical & Materials Engineering, 2022- present
- Director, Institute of Materials Research, 2020-22
- Director, MSEP 2017 – 2020
- Assistant Director, MSEP, 2016
- Faculty Search Committee, MME, 2013-14; reviewed >400 applicants; hired 4 new professors to School of Mechanical & Materials Engineering
- Graduate Studies Committee, MME, 2014-15, 2017-18, 2020-21
- Admissions committee, MSEP, 2014 - 2020
- Advisor to Materials Advantage student club, 2015-2017
- Reactor Safeguards Committee, 2020 - 2022
- Teaching assessment committee for faculty tenure & promo (MME, ChemE) – 2018

Outreach and community service

- Education: visit elementary school classes to talk about geology/mineralogy, magnetism; 2014 –
- Education: teach STEM subjects in Cub Scouts group: geology, engineering, forestry; 2013 –
- Coaching: youth sports assistant coaching including baseball, soccer, football, and wrestling, 2009 -

Pacific Northwest National Laboratory, Richland, WA (6/08 – 7/13)

Senior Research Scientist (S&E IV), Energy & Environment Directorate, Radiological & Nuclear Division (6/08 – 7/13)

- Research scientist and project manager: sensors, glasses, magnetic materials, and spectroscopy
  - 30+ peer reviewed journal publications resulting from PNNL-related work.
  - Experienced project manager; wrote concept white papers, proposals; managed projects of all sizes from $50k-$1M+, usually multiple project simultaneously
  - Conceived, captured, and directed $1M project for electromagnetic materials as novel radiation detectors
  - Fluent in interpreting material characterization data of many types (spectroscopy, microscopy, etc.) in conjunction with subject-matter-experts including Raman spectroscopy, FTIR, UV-VIS, prism coupling, SEM, EMPA, TEM, XANES, Mossbauer, NMR, EPR, XPS, ICP-OES, LA-ICP-MS
  - Expertise in electrical and magnetic measurements and materials including AC magnetic susceptibility, DC magnetization (vs H and T), first-order reversal curves (FORC), MFM, resistivity, and Hall effect
  - Expertise in radiation (ion, gamma-ray, neutron) -induced changes in magnetic and dielectric materials
  - Expertise in glass chemistry, including sodium alumino-boro-silicate nuclear waste glasses, chalcogenide glasses, and other more exotic glass-forming systems
  - Expertise in sensors for non-destructive evaluation (NDE) in extreme environments (high temperature, radiation fields) including acoustic, magnetic, electrical, and radiometric measurements
- Team Lead, Glass & Materials Science Team, Radiological Materials & Technology Development (2010-13)
  - Successfully managed team of 17-25 people, consisting of 11-14 permanent staff, 3-6 full-time students, and 2-10 part-time and summer students.
  - Reviewed and approved all technical products from team, including presentations, journal articles, and technical reports; encouraged team technical publication by institution of paper recognition
  - Wrote and delivered performance appraisals for annual staff development reviews; successfully advocated for 5 staff promotions
  - Performed hiring function for >10 staff and students, writing requisitions, evaluating resumes, performing interviews, and negotiating salaries with HR
  - Assisted project managers in staffing by matching skills and availability within team, by hiring, and by coordinating with other group managers
  - Performed administrative functions for timecards, travel requests, expense reports, lab access requests, visit authorizations, new hire briefings, and safety reviews

- Met regularly with group (department) manager and other team leads as part of leadership team to understand and flow down lab- and division-level information
- Organized development of group external website, generating and soliciting technical content advertising the capabilities and expertise of the team
- Sat on senior staff group strategy development team
- Wrote many letters of recommendation for staff and students
- Personally mentored 5 summer students

Raytheon Missile Systems, Tucson, AZ (5/00 – 5/08)

Senior Mechanical Engineer II (E04) with Honors (5/06 – 5/08)

- Lead materials technologist in Opto-mechanical design department specializing in infrared window materials
- Manage various materials-related R&D projects totaling >$1 M per year, with teams of at least 10 people
- Projects included
  - modeling of properties of transparent nano-composite ceramics
  - low-cost processing of multispectral zinc sulfide ceramic for infrared windows
  - ceramic processing and properties of yttria, spinel, YAG, and sapphire
  - durable antireflective thin-film coatings by RF magnetron sputtering
  - optical black surfaces for stray light rejection and emissivity control
- Raytheon symposia session chair and lead for Electromagnetic Materials Technology Interest Group, managing funding opportunities and collaboration in metamaterials, photonic crystals, radomes, infrared domes, laser gain materials, transparent conductors, low observable materials, nonlinear dielectrics, etc.
- Member of conference organizing committee: Windows & Domes Technologies & Materials, part of SPIE Defense & Security Symposium (odd years) & DoD Electromagnetic Windows Symposium (even years)

Senior Multi-Disciplined Engineer with Honors (9/03 - 5/06)

- Completed engineering rotation program in Optics, Opto-mechanics, and Integration & Test organizations
- Test lead for composite nosecone design verification: vibration testing, rain erosion rocket sled
- Test team for hardware and software integration, test, and analysis of kinetic warheads
- Designed sensor seeker dome: supported proposal activity, performed analysis, interfaced with suppliers.

Senior Manufacturing Project Engineer (5/00 - 9/03)

- Project Manager for Cryostat Test Station from concept through equipment prove-in, including hardware and software requirements, design, scheduling and cost tracking, risk management, and integration
- Lead production engineer in cryostat manufacturability involving Design of Experiments (DOE), variability reduction, new processes, and engineering changes; key member of root cause and corrective action teams.
- Managed quality, cost, schedule & producibility in Electro-Optic Sensors & Precision Assembly factory.

Crane Interpoint, Redmond, WA (1/98- 9/99)

Process Engineer II

- Technical support for hybrid microelectronics manufacturing facility including thickfilm ceramic slurry technology, welding, packaging, and implantable heart defibrillator device

Massachusetts Institute of Technology, Cambridge, MA (5/93 – 5/97)
Intel Corporation, Chandler, AZ (6/95 – 9/95)
Southern California Gas Company, San Dimas, CA (6/94 – 9/94)

Undergraduate researcher and intern

- Summer research in powder metallurgy and oxidation of carbon-carbon composites and nickel superalloys
- Summer internship with Intel in data analysis of die attach process parameters

- Summer internship with Southern California Gas company in writing of metal heat treating handbook for customers

AWARDS AND HONORS

- **Anjan Bose Outstanding Researcher Award, WSU Voiland College of Engineering & Architecture, 2020**
- **Fulbright Scholar, US Department of State and US-UK Commission, 2019**
- **Fellow of the American Ceramic Society, 2018**
- **Richard M. Fulrath Award (promoting US-Japan collaboration), American Ceramic Society, 2018, http://ceramics.org/?awards=richard-m-fulrath-awards**
- **Outstanding Researcher Faculty Member, School of Mechanical & Materials Engineering, Voiland College of Engineering and Architecture, Washington State University, 2018**
- **Outstanding Teaching Faculty Member, School of Mechanical & Materials Engineering, Voiland College of Engineering and Architecture, Washington State University, 2016**
- Promoted to Senior member, SPIE, 2015
- Delegate to National Academy of Engineering, Germany-American Frontiers in Engineering (GAFOE), Potsdam, Germany, 2015.
- Delegate to National Academy of Engineering, US Frontiers in Engineering (FOE), Wilmington, DE, 2013.
- Inducted into Order of the Engineer, 2013.
- Adjunct faculty member, Washington State University, Tri-Cities campus, School of Mechanical and Materials Engineering, 2011-2013
- Sigma Xi, full member, 2010
- PNNL Scientist & Engineer Development Program, 2010-2011.
- Michael C. Weinberg memorial scholarship, University of Arizona, 2007-8.
- Keramos: Ceramics Honor Society, inducted 2007.
- SPIE scholarship award in optical science and engineering, 2007.
- Best-in-show, Electromagnetic Materials Technical Interest Group, Raytheon Mechanical and Materials Technology Network Symposium, "Optical Blacks: Properties and Processing," 2007.
- Raytheon certifications: Project Management; Systems Engineering; Integration, Test, and Analysis; Software Engineering; Manufacturing Project Engineering; Six Sigma Specialist
- Peer-voted "with Honors" designations at Raytheon, 2005, 2007.
- Honorable mention, National Science Foundation graduate fellowship, 1996.
- President of Iota Mu chapter of Phi Gamma Delta fraternity, MIT, 1995
- Eagle Scout, Boy Scouts of America, 1991

PUBLICATIONS: (note # indicates WSU student)

SUMMARY

- International peer-reviewed journal articles: 196
- Books: 1
- Book chapters: 5
- Conference proceedings papers: 30
- Technical reports (public): 35
- Patents: 3

Google Scholar: https://scholar.google.com/citations?user=zI6h66AAAAAJ
>5100 citations since 2013. **H-index = 35. i10-index = 119**.
ORCID # 0000-0001-7476-7771
ResearcherID # D-3630-2013; HJB-3380-2022

PUBLICATIONS CITED ≥10 TIMES (per Google Scholar) SHOWN IN BOLD
is WSU student author related to the McCloy research group

BOOKS

1. **J. McCloy, R. Tustison. *Chemical Vapor Deposited Zinc Sulfide*. Bellingham, WA: SPIE Press (April 2013), ISBN 9780819495891, http://spie.org/x648.html?product_id=2022659.**

BOOK CHAPTERS

1. M. R. Cicconi, J. S. McCloy, D. R. Neuville, "Non-magmatic glasses," Ch. 21 in *Reviews in Mineralogy and Geochemistry* Vol. 87: Geological Melts, pp. 965-1014. https://doi.org/10.2138/rmg.2022.87.21
2. Kakkireni, S.,# M. Murugesan,# B. Montag, and J. McCloy, "Seeded Crystal Growth of Cd-Zn-Te (CZT) Assisted via Numerical Modelling," In *Emerging Materials: Design, Characterization and Applications*, L.R. Thoutam, S. Tayal, and J. Ajayan, Springer Nature Singapore, Singapore, 103-131 (2022). https://doi.org/10.1007/978-981-19-1312-9_3
3. Kakkireni, S.,# S.K. Swain, K.G. Lynn, and J.S. McCloy, "Melt Growth of High-Resolution CdZnTe Detectors," In *Advanced Materials for Radiation Detection*, K. Iniewski, Springer International Publishing, Cham, 265-284 (2022). http://www.doi.org/10.1007/978-3-030-76461-6_12
4. John S. McCloy, "Spin and Ferroic Glasses," In *Springer Handbook of Glass*, J.D. Musgraves, J. Hu, and L. Calvez, Springer Nature, Switzerland, 687-718 (2019). http://www.doi.org/10.1007/978-3-319-93728-1_20
5. **J. S. McCloy, C. Rodriguez, C. Windisch, C. Leslie, M. J. Schweiger, B. R. Riley, and J. D. Vienna, "Alkali/Alkaline-Earth Content Effects on Properties of High-Alumina Nuclear Waste Glasses"; pp. 63-76 in Ceramic Transactions, Vol. 222, *Advances in Materials Science for Environmental and Nuclear Technology*. Edited by K. M. Fox, E. N. Hoffman, N. Manjooran and G. Pickrell. John Wiley & Sons, Inc., Hoboken, New Jersey, (2010). http://www.wiley.com/WileyCDA/WileyTitle/productCd-0470927291.html**

JOURNAL ARTICLES (categorized-most recent 1st each categ.)

OPTICAL, MAGNETIC, & ELECTRONIC MATERIALS

2023

1. Wang, C., P. Sireesha, J. Shang,# J.S. McCloy, J. Liu, and W.-H. Zhong, "Converting commercial Fe2O3 to effective anode material using glucose as "etching" agent," *Ceramics International*, 49(20), 32652-32662 (2023). https://doi.org/10.1016/j.ceramint.2023.07.234
2. Dong, P., X. Zhang, W. Hiscox, J. Liu, J. Zamora,# X. Li, M. Su, Q. Zhang, X. Guo, J. McCloy, and M.-K. Song, "Towards High-Performance Metal-Organic-Framework-Based Quasi-Solid-State Electrolytes: Tunable Structures and Electrochemical Properties," *Advanced Materials*, 35(32), 2211841, https://doi.org/10.1002/adma.202211841.
3. Balog, A.R., L. Miao, S. Bachu, J. Jesenovec,# B. Dutton,# J. McCloy, and N. Alem, "High Resolution Scanning Transmission Electron Microscopy (S/TEM) Investigation of Common Defects In Scandium and Aluminum Alloyed β-Ga_2O_3," *Microscopy and Microanalysis*, 29(Supplement_1), 1779-1780 (2023). https://doi.org/10.1093/micmic/ozad067.921

4. Jing Shang,# Magesh Murugesan,# Samuel Bigbee-Hansen,# Santosh K. Swain, Joel N. Duenow, Steve Johnston, Scott P. Beckman, Harvey H. Walker,# Raine W. Antonio,# John S. McCloy, "The Effect of Dopant Concentration and Annealing Treatments on N-type Iodine Doped CdTe," *Journal of Alloys and Compounds*, 960, 170625 (2023), https://doi.org/10.1016/j.jallcom.2023.170625
5. Lauren Barmore, Jani Jesenovec,# John McCloy, Matthew McCluskey, "Photoluminescence of Cr^{3+} in β-Ga_2O_3 and $(Al_{0.1}Ga_{0.9})_2O_3$ under pressure," *Journal of Applied Physics*, 133(17), 175703 (2023), https://doi.org/10.1063/5.0149900
6. Syeed E. Ahmed, Violet M. Poole, Jani Jesenovec,# John S. McCloy, and Matthew D. McCluskey, "Room Temperature Persistent Photoconductivity in Barium Calcium Titanate Alloys ($Ba_{1-x}Ca_xTiO_3$)", *Journal of Electronic Materials*, 52(4), 2499-2504 (2023), https://doi.org/10.1007/s11664-022-10205-9
7. Panpan Dong, Xiahui Zhang, Julio Zamora,# John McCloy, and Min-Kyu Song, "Silk Fibroin-based Biopolymer Composite Binders for High-Performance Micro-Sized Silicon Anodes with Enhanced Rate Capability and Long Cycle Life," *Journal of Energy Chemistry*, 80, 442-451 (2023), https://doi.org/10.1016/j.jechem.2023.02.010
8. Cassandra Remple, Lauren M. Barmore, Jani Jesenovec,# John S. McCloy, Matthew D. McCluskey, "Photoluminescence Spectroscopy of Cr^{3+} in β-Ga_2O_3 and $(Al_{0.1}Ga_{0.9})_2O_3$," *Journal of Vacuum Science & Technology A*, 41(2), 022702 (2023). https://doi.org/10.1116/6.0002340
9. Adam Danielson, Carey Reich, Ramseh Pandey, Amit Munshi, Arthur Onno, Will Weigand, Darius Kuciauskas, Siming Li, Alexandra Bothwell, Jinglong Guo, Magesh Murugesan,# John McCloy, Robert Klie, Zachary Holman, Walajabad Sampath, "Electro-optical characterization of arsenic-doped CdSeTe and CdTe solar cell absorbers doped in-situ during close space sublimation," *Solar Energy Materials and Solar Cells*, 251, 112110 (2023). https://doi.org/10.1016/j.solmat.2022.112110

2022

10. Timothy Gustafson, Nancy Giles, Brian Holloway, Jani Jesenovec,# Benjamin Dutton,# John McCloy, Matthew McCluskey, and Larry Halliburton, "Transition-metal ions in β-Ga_2O_3 crystals: Identification of Ni acceptors," *Journal of Applied Physics*, 132(18), 185705 (2022). https://doi.org/10.1063/5.0126467
11. Jacqueline Cooke, Praneeth Ranga, Jani Jesenovec,# Arkka Bhattacharyya, Xueling Cheng, Yunshan Wang, John McCloy, Sriram Krishnamoorthy, Michael Scarpulla, and Berardi Sensale-Rodriguez, "Photoluminescence microscopy as a noninvasive characterization method for defects in gallium oxide and aluminum gallium oxide epitaxial films," *Optical Materials Express*, 12(11), 4341-4353 (2022). https://doi.org/10.1364/OME.474921
12. Chenxu Wang, Chunhua Ying, Jing Shang,# Sam Ellery Karcher,# John McCloy, Jin Liu, Wei-Hong Zhong, "Biomimetic Protein Coating for Stabilizing Li Metal Batteries," *ACS Applied Materials and Interfaces*, 14(38), 43886-43896 (2022). https://doi.org/10.1021/acsami.2c10667
13. Rubi Gul, John McCloy, Magesh Murugesan,# Benjamin Montag, Jasdeep Singh,# "Cl- doped CdTe Crystal Growth for Medical Imaging Applications," *Crystals*, 12(10), 1365 (2022). https://doi.org/10.3390/cryst12101365
14. Jani Jesenovec,# Benjamin Dutton,# Cassandra Remple, Natalie Smith-Gray,# Magesh Murugesan,# Carl Peterson, Brooke Downing,# Sriram Krishnamoorthy, Matthew McCluskey, and John McCloy, "Alternative Alloy to Increase Bandgap in Gallium Oxide, β-$(Sc_xGa_{1-x})_2O_3$, and Rare Earth Stark Luminescence," *Journal of Crystal Growth*, 596, 126823 (2022). https://doi.org/10.1016/j.jcrysgro.2022.126823
15. **Jani Jesenovec,# Benjamin Dutton,# Nicholas Stone-Weiss,# Adrian Chmielewski, Muad Saleh,# Carl Peterson, Nasim Alem, Sriram Krishnamoorthy, John McCloy, "Alloyed β-$(Al_xGa_{1-x})_2O_3$ bulk Czochralski single β-$(Al_{0.1}Ga_{0.9})_2O_3$ and polycrystals β-$(Al_{0.33}Ga_{0.66})_2O_3$, β-$(Al_{0.5}Ga_{0.5})_2O_3$), and property trends," *Journal of Applied Physics*, 131(15), 155702 (2022). https://doi.org/10.1063/5.0073502**
16. **Shichao Ding, Zhaoyuan Lyu, Erik Sarnello, Mingjie Xu, Lingzhe Fang, Hangyu Tian, Sam Ellery Karcher,# Tao Li, Xiaoqing Pan, John McCloy, Guodong Ding, Qiang Zhang, Qiurong Shi, Dan Du, Jin-Cheng Li, Yuehe Lin, "MnO_x Enhanced Atomically Dispersed Iron-Nitrogen-Carbon Catalyst for Oxygen Reduction Reaction, *Journal of Materials Chemistry A*, 10, 5981-5989 (2022) https://doi.org/10.1039/D1TA07219F**
17. **Jacqueline Cooke, Praneeth Ranga, Jani Jesenovec,# John S. McCloy, Sriram Krishnamoorthy, Michael A. Scarpulla, and Berardi Sensale-Rodriguez "Effect of extended defects on photoluminescence of gallium oxide and aluminum gallium oxide epitaxial films," *Scientific Reports*, 12(1), 3243 (2022). https://doi.org/10.1038/s41598-022-07242-z**
18. Leila Ghadbeigi, Rujun Sun, Jani Jesenovec,# Arkka Bhattacharyya, John McCloy, Sriram Krishnamoorthy, Michael A. Scarpulla, and Berardi Sensale-Rodriguez, "Electronic and ionic conductivity in β-Ga_2O_3 single crystals," *Journal of Applied Physics*, 131(8), 085102 (2022). https://doi.org/10.1063/5.0073395
19. **Jani Jesenovec,# Christopher Pansegrau, Matthew D. McCluskey, John S. McCloy, T.D. Gustafson, L.E. Halliburton, and J.B. Varley "Persistent room temperature photodarkening in Cu-doped β-Ga_2O_3" *Physical Review Letters*, 128(7), 077402 (2022). https://doi.org/10.1103/PhysRevLett.128.077402**

20. Gustafson, T.D., N.C. Giles, B.C. Holloway, C.A. Lenyk, J. Jesenovec,# J.S. McCloy, M.D. McCluskey, and L.E. Halliburton, "Cu^{2+} and Cu^{3+} acceptors in β-Ga_2O_3 crystals: A magnetic resonance and optical absorption study," *Journal of Applied Physics*, 131(6), 065702 (2022). https://doi.org/10.1063/5.0080502

21. Jani Jesenovec,# Cassandra Remple, Jesse Huso, Benjamin Dutton,# Parker Toews,# Matthew D. McCluskey, John S. McCloy, "Photodarkening and Dopant Segregation in Cu-doped β-Ga_2O_3 Czochralski Single Crystals," *Journal of Crystal Growth*, 578, 126419 (2022). https://doi.org/10.1016/j.jcrysgro.2021.126419

2021

22. Adrian Chmielewski, Ziling Deng, Muad Saleh,# Jani Jesenovec,# Wolfgang Windl, Kelvin Lynn, John McCloy, Nasim Alem, "Atomic-Scale Characterization of Structural and Electronic Properties of Hf doped β-Ga_2O_3" *Applied Physics Letters*, 119, 172102 (2021). https://doi.org/10.1063/5.0062739
23. Christopher Pansegrau, Jani Jesenovec,# John McCloy, Matthew McCluskey, "Zinc-hydrogen and zinc-iridium pairs in β-Ga_2O_3," *Applied Physics Letters*, 119(10), 102104 (2021), http://doi.org/10.1063/5.0062059

24. Jani Jesenovec,# Marc Weber, Christopher Pansegrau, Matthew McCluskey, Kelvin Lynn, and John McCloy, "Gallium Vacancy Formation in Oxygen Annealed β-Ga_2O_3," *Journal of Applied Physics*, 129(24), 245701 (2021). https://doi.org/10.1063/5.0053325

25. J. Jesenovec,# J. Varley, S.E. Karcher,# and J.S. McCloy, "Electronic and optical properties of Zn-doped β-Ga_2O_3 Czochralski single crystals," *Journal of Applied Physics*, 129(22), 225702 (2021). https://doi.org/10.1063/5.0050468

26. Santosh Swain, Marc Weber, Jani Jesenovec,# Muad Saleh,# Kelvin Lynn, John McCloy, "Compensation of shallow donors by gallium vacancies in β-Ga_2O_3," *Physical Review Applied*, 15(5), 054010 (2021). https://doi.org/10.1103/PhysRevApplied.15.054010

27. Timothy Gustafson, Jani Jesenovec,# Christopher Lenyk, Nancy Giles, John McCloy, Matthew McCluskey, and Larry Halliburton, "Zn acceptors in β-Ga_2O_3 crystals," *Journal of Applied Physics*, 129(15), 155701 (2021). https://doi.org/10.1063/5.0047947

28. A.J. Lere-Adams,# M. Ahmadzadeh,# N. Smith-Gray,# D. Bollinger,# S. Boroughs, and J.S. McCloy, "In situ crystallization and magnetic measurement of hexaferrite glass-ceramics," *AIP Advances*, 11(3), 035318 (2021). https://doi.org/10.1063/9.0000063
29. Michael Kindle,# Younghwan Cha, John McCloy, Min-Kyu Song, "Alternatives to Cobalt: Vanadate Glass and Glass-Ceramic Structures as Cathode Materials for Rechargeable Lithium-ion Batteries," *ACS Sustainable Chemistry and Engineering*, 9(2), 629-638 (2021). https://pubs.acs.org/doi/10.1021/acssuschemeng.0c04026

2020

30. Muad Saleh,# Saketh Kakkireni,# John McCloy, Kelvin Lynn, "Improved Nd distribution in Czochralski grown YAG crystals by implementation of the accelerated crucible rotation technique," *Optical Materials Express* 10(2), 632-644 (2020). https://doi.org/10.1364/OME.380174
31. L. R. Khanal, L., M. Ahmadzadeh,# J.S. McCloy, and Y. Qiang, "Relationship between Nanostructure-Magnetic Property Induced by Temperature for Iron Oxide Nanoparticles in Vacuum, Ar and O_2 Environments," *Journal of Magnetism and Magnetic Materials*, 498, 166158 (2020). https://doi.org/10.1016/j.jmmm.2019.166158

2019

32. John McCloy, Walter Wolf, Erich Wimmer, W.H. Poisl, Brian Zelinski, "Computational and Experimental Identification of Hydrogen Defect Vibrational Modes in Zinc Sulfide" *Journal of Applied Physics*, 126(17), 173101 (2019). http://dx.doi.org/10.1063/1.5123493

33. Ke Xu,# Marc Weber, Yue Cao,# Weilin Jiang, Danny Edwards, Brad Johnson, John McCloy, "Ion irradiation induced changes in defects of iron thin films: electron microscopy and positron annihilation spectroscopy," *Journal of Nuclear Materials*, 526, 151774 (2019). https://doi.org/10.1016/j.jnucmat.2019.151774

34. M. Kindle,# S. Kmiec, I. d'Anciães Almeida Silva, H. Eckert, S.W. Martin, M.-K. Song, and J.S. McCloy, "Structural properties of alumina-doped lithium borovanadate glasses and glass-ceramics," *Journal of Non-Crystalline Solids*, 521, 119551 (2019). https://doi.org/10.1016/j.jnoncrysol.2019.119551

35. Jonathan Moore,# Emily Nienhuis, Mostafa Ahmadzadeh, John McCloy, "Synthesis of Greigite (Fe_3S_4) Nanoparticles via a Hydrothermal Method," *AIP Advances*, 9(3), 035012 (2019). https://doi.org/10.1063/1.5079759

36. **J. Lonergan, C. Lonergan, J. McCloy, and K.A. Richardson, "Modeling and experimental determination of physical properties of $Ge_xGa_ySe_{1-x-y}$ chalcogenide glasses II: Optical and thermal properties," *Journal of Non-Crystalline Solids*, 511, 115-124 (2019). https://doi.org/10.1016/j.jnoncrysol.2019.01.034**
37. **Jason Lonergan, Charmayne Smith, John McCloy, Kathleen Richardson, "Modeling and Experimental Determination of Physical Properties of Ge_x-Ga_y-Se_{1-x-y} Chalcogenide Glasses I: Structure and mechanical properties," *Journal of Non-crystalline Solids*, 510, 192-199 (2019). https://doi.org/10.1016/j.jnoncrysol.2019.01.031**
38. **Muad Saleh,# Kelvin Lynn, Luiz Jacobsohn, John McCloy, "Luminescence of Undoped Commercial ZnS Crystals: Evidence on the Role of Impurities using Photoluminescence and Electrical Transient Spectroscopy," *Journal of Applied Physics*, 125(7), 075702 (2019). https://doi.org/10.1063/1.5084738**
39. **D. Patil,# M. Konale, S. Cozic, L. Calvez, V. Zima, T.s Wagner, J. S. McCloy, D. Le Coq, "Percolation behavior of Ag in $Ge_{16}Sb_{12}Se_{72}$ glassy matrix and its impact on corresponding ionic conductivity," *Journal of Alloys and Compounds,* 782, 375-383 (2019), https://doi.org/10.1016/j.jallcom.2018.12.140**
40. **R. Danaei, T. Varghese, M. Ahmadzadeh,# J. McCloy, C. Hollar, M. Sadeq Saleh, J. Park, Y. Zhang, and R. Panat, "Ultrafast Fabrication of Thermoelectric Films by Pulsed Light Sintering of Colloidal Nanoparticles on Flexible and Rigid Substrates," *Advanced Engineering Materials,* 21(1), 1800800 (2019). https://doi.org/10.1002/adem.201800800**

2018

41. **Y. Cao,# M. Ahmadzadeh,# K. Xu,# B. Dodrill, and J.S. McCloy, "Multiphase magnetic systems: Measurement and simulation," *Journal of Applied Physics*, 123(2), 023902 (2018). https://doi.org/10.1063/1.5010799**
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PATENTS AND PATENT APPLICATIONS

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   - European Patent Application #08861458.1-2122/2234936, http://www.google.com/patents/EP2234936B1
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4. **John McCloy, Ralph Korenstein, Peter Cremin, Randal Tustison, USPTO Application #2010/0035036, "Durable Antireflective Multispectral Infrared Coatings" http://www.google.com/patents/US20100035036**
    - European Patent Application, #09799773.8-1215/2231724, http://www.google.com/patents/EP2331724A2
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INVITED PRESENTATIONS (most recent 1st)

2023

1. John McCloy et al, "Pioneering a cermet waste form for disposal of waste streams from advanced reactors (PACE-FORWARD)," *Invited* presentation for U.S. DOE NE-43 Cermet Waste Forms for Nuclear Fuel Cycle Technologies Workshop, Argonne National Laboratory, IL, October 18, 2023.
2. John McCloy, "Incorporation of chlorine and fluorine in nuclear waste glasses," *Invited* presentation for the Immobilisation Sciences Laboratory seminar series, University of Sheffield, **UK**, October 2, 2023.
3. John McCloy et al, "International Perspectives on Glass Waste Form Development for Low and Intermediate Level Radioactive Waste," *Invited* presentation for Sumglass, 3rd international Summer School on nuclear and industrial glasses for energy transition, Nîmes, **France**, September 26, 2023.
4. John McCloy, "Glass through the centuries," *Keynote* presentation for special event Glass Comes Alive, Jordan Schnitzer Museum at Washington State University, Pullman, WA, August 30, 2023. https://www.youtube.com/watch?v=h3hk8JUc1c0
5. John McCloy et al, "Bulk Crystal Growth and Opto-electronic Characterization of β-Ga_2O_3," *Invited* presentation for 23rd American Conference on Crystal Growth and Epitaxy (ACCGE-23), Tucson, Arizona, USA, August 14, 2023.
6. John McCloy, "Overview of glasses versus glass-ceramics for nuclear wastes immobilization," *Invited* highlight presentation for XVIII European Ceramic Society (ECerS), Lyon, **France**, July 2, 2023.
7. John McCloy, "Incorporation of volatiles in nuclear waste glasses: partitioning between silicate and salt phases," *Invited* special seminar for for Institut de Minéralogie, de Physique des Matériaux et de Cosmochimie (IMPMC), Sorbonne, Paris, **France**, June 28, 2023.
8. John McCloy et al, "Refractory corrosion in Joule-heated melters for nuclear waste vitrification," *Invited* presentation for American Ceramic Society, Glass and Optical Materials Division Meeting (GOMD), New Orleans, LA, June 5, 2023.
9. John McCloy, "Crystal Growth and Opto-electronic Characterization of Oxides and Chalcogenides," *Invited* presentation for University of Idaho Physics Colloquium, Moscow, ID, March 20, 2023.

2020-2022

10. John McCloy, "Cultural Brokers and Interdisciplinary Research in Engineering: the Case Study of Vitrified Hillforts," *Invited* presentation for Washington State University School of Mechanical & Materials Engineering graduate seminar, Pullman, WA, Oct 19, 2022.
11. John McCloy, Sophie Schuller, "Overview of glasses versus glass-ceramics for nuclear wastes immobilization," *Invited* presentation for International Congress on Glass (ICG), Berlin, **Germany,** July 5, 2022.
12. J. McCloy et al, "The effect of transition metals on the structure of aluminosilicate glasses and melts: Fe (and Ti)," *Invited* presentation for International Congress on Glass (ICG), Berlin, **Germany**, July 5, 2022.
13. J. McCloy, "Nuclear materials and disposal of radioactive waste," *Invited* presentation for PNNL-WSU Joint Nuclear Science and Technology Institute (NSTI) webinar, June 14, 2022.
14. J. McCloy, "Nuclear Past and Futures in the USA, with Emphasis on Washington State," *Invited* presentation for Global Approaches to Radioactive Waste Immobilisation and Vitrification, virtual, March 2, 2021. https://meetshu.webex.com/recordingservice/sites/meetshu/recording/a6bc141669904091a201591b3dbedb13/playback
15. J. McCloy, "Nuclear Past and Futures in the State of Washington and Beyond," *Invited* Anjan Bose Outstanding Researcher Award Lecture, virtual, Pullman, WA, November 16, 2020.
16. J. McCloy, "Materials Solutions for Nuclear and Solar Energy," *Invited* seminar, virtual, Voiland Department of Chemical Engineering graduate seminar, Washington State University, Pullman, WA, Aug. 31, 2020.
17. J. McCloy, "Nuclear Power and Nuclear Waste Management: International Comparisons," Invited speaker at Materials Science & Engineering Program graduate seminar, Washington State University, Pullman, WA, Jan. 31, 2020

2019

18. J. McCloy, "The Nuclear, Optical, Magnetic, & Electronic (NOME) Materials Laboratory at Washington State University: BITS AND BOBS," *Invited* special seminar at University of Sheffield, **UK**, Dec 4, 2019.
19. J. McCloy, "Nuclear Waste Management: International Comparisons," *Invited* special seminar at Immobilisation Sciences Laboratory, University of Sheffield, **UK**, Dec 4, 2019.
20. J. McCloy, "Unconventional oxide glasses: borovanadates and sulfates," *Invited* special seminar at Sheffield Hallam University, **UK**, Nov 25, 2019.
21. J. McCloy, "Recent studies related to problematic elements in nuclear waste vitrification," *Invited* special seminar at the Central Research Institute of Electric Power Industry (CRIEPI), Nagoya, **Japan**, Nov 6, 2019.
22. J. McCloy, "Characterization of Optical, Magnetic, and Electronic Properties of Glass-Ceramics," *Invited* special seminar at National Institute of Advanced Industrial Science and Technology (AIST Chubu), Structural Materials Research Institute, Nagoya, **Japan**, Nov 5, 2019.
23. J. McCloy, "Characterization of Optical and Magnetic Properties of Glass-Ceramics," *Invited* special seminar at Tokyo University of Technology, Tokyo, **Japan**, Nov 1, 2019.
24. J. McCloy, "Crystallization of nepheline and related phases from glass: The ACerS Richard M. Fulrath award winner (2018) lecture in Japan 2019," The 13th Pacific Rim Conference of Ceramic Societies (PACRIM13), Okinawa Convention Center, **Japan**, Oct 29, 2019.
25. J. McCloy, "Glass Structure and Crystallization: from Nuclear Waste to Volcanoes," *Invited* presentation, Rutgers University, Department of Materials Science & Engineering Seminar, Picsataway, NJ, October 8, 2019.
26. J. McCloy, H. Chen, "Partitioning of rare-earth cations in multiphase glass-ceramics," *Invited* presentation, Emerging applications in glass, Glasses for nuclear waste immobilization, International Congress on Glass (ICG 2019), Boston, MA, June 12, 2019.
27. J. McCloy, "Structure and crystallization of nepheline and related phases from glass," *Invited* presentation, Géomatériaux Seminaire, Transport properties of magmas, melts and glasses, Institut de Physique du Globe de Paris (IPGP), Université de Paris, Paris, **France**, June 7, 2019.
28. J. McCloy, "Natural or Unnatural?: Glassmaking as glorified rock-burning," *Invited* presentation, Frontiers in Glass: at the Interface between Earth Science and Synthetic Materials. Workshop supported by the EPSRC NetworkPlus in Emergence and Physics Far From Equilibrium, Bristol, **UK**, May 21, 2019.
29. J. McCloy, "Studies on Tc and Mo in nuclear waste glass," *Invited* Séminaire Scientifique at the Commissariat à l'énergie atomique et aux énergies alternatives (CEA), Direction de l'Energie Nucléaire, Département de recherche sur les technologies pour l'Enrichissement, le Démantèlement et les Déchets, Service d'Etudes de Vitrification et procédés hautes Températures, Laboratoire de Développement des Procédés de Vitrification, Marcoule, **France**, May 13, 2019.

2018

30. J. McCloy, "Experimental Confirmation of Rock Melting in Iron Age Swedish Vitrified Hillfort," *Invited* presentation at MS&T18, Columbus, OH, Oct 17, 2018.
31. J. McCloy, "Crystallization of Rare-Earth Containing Phases in Molybdenum-Containing Alumino-boro-silicate Glasses," *Invited* presentation at MS&T18, Columbus, OH, Oct 15, 2018.
32. McCloy; MS&T, Columbus, Oct 2018, "Undividing the Discipline: Social Interfaces in Ceramics Science and Engineering" *Invited* award presentation, Fulrath lecture, at MS&T18, Columbus, OH, Oct 15, 2018.
33. J. McCloy, "Fundamental problems and advanced solutions for alkaline waste treatment at Hanford DOE," *Invited* presentation at the 2nd International School-Seminar on the Fundamental Basis for Advanced Treatment of Radioactive Waste, Russian Academy of Sciences, Moscow, **Russia**, September 28, 2018.
34. J. McCloy; "Natural and Unnatural Glasses: An Interdisciplinary Dialogue," *Invited* presentation at International Congress on Ceramics (ICC7), Foz do Iguacu, **Brazil**, June 19, 2018.
35. J. McCloy,* "Optical, Magnetic, and Electronic Characterization of Materials for Nuclear Applications: A Series of Vignettes," *Invited* presentation at Clemson University, SC, Materials Science & Engineering Seminar Series, Mach 8, 2018.

2017

36. J. McCloy,* "Vitrified Hillforts as Anthropogenic Analogues for Nuclear Waste Glasses," *Invited* presentation at ACerS Workshop on Technology for Conservation of Cultural Heritage, University of Maryland College Park, MD, December 13, 2017.
37. J. McCloy,* "Contributions of Geosciences to Nuclear Waste Management: Understanding the History of 1500-Year-Old Glass at Pre-Viking Swedish Vitrified Hillfort Site," *Invited* presentation at the University of Wisconsin Milwaukee, WI, Geosciences Department Colloquium, September 21, 2017.

38. J. McCloy,* "Nuclear waste vitrification research," *Invited* presentation at the Vitreous State Laboratory, the Catholic University of America, Washington, DC, August 24, 2017.
39. J. McCloy,* Ashutosh Goel, "Glass-ceramics for nuclear waste management," *Invited* MRS Webinar, March 22, 2017. http://www.prolibraries.com/mrs/?select=session&sessionID=6308

2016

40. J. McCloy,* "Synthesis and Characterization of 5- and 6- Coordinated Alkali Pertechnetates," *Invited* presentation at Scientific Basis for Nuclear Waste Management, Materials Research Society meeting, Boston, MA, November 29, 2016.
41. J McCloy,* "Structure and Crystallization in Silicate Melts and Minerals," Materials Science and Technology (MS&T), Salt Lake City, UT, Oct 2016.
42. J. McCloy,* "Glass formation, crystallization, and Don," *Invited* presentation at Festschrift für Don Uhlmann, the American Ceramic Society Glass and Optical Materials Division (GOMD) meeting, Madison, WI, May 23, 2016.
43. J. McCloy,* "Basic research on technetium in alkali oxide glasses," *Invited* presentation at Immobilisation Sciences Laboratory symposium, University of Sheffield, **UK**, April 22, 2016.
44. J. McCloy,* "Basic research on technetium in alkali oxide glasses," *Invited* presentation at 2nd DISTINCTIVE (Decommissioning, Immobilisation and Storage soluTIons for NuClear wasTe InVEntories) symposium, Bristol, **UK**, April 20, 2016.
45. J. McCloy,* "Iodine-129 waste forms: Apatite & Sodalite," *Invited* presentation at DOE Nuclear Energy Materials Recovery and Waste Form Development Working Group Meeting, Richland, WA, March 23, 2016.
46. J. McCloy,* "Hanford Nuclear Waste Vitrification: Processing and Chemistry Considerations," *Invited* presentation at Washington State University, Analytical, Environmental, & Radiochemistry (AER) Seminar series, Pullman, WA, January 22, 2016.

2013-2015

47. J. McCloy,* Brian Riley, "Structure, Optical Properties, and Crystallization in Multicomponent Chalcogenide Glasses," *Invited* presentation at University of Central Florida, CREOL, Orlando, FL, May 15, 2015.
48. J. McCloy,* "Nanoglasses: Interface and exchange in glass science and magnetism," *Invited* presentation at Materials Science & Technology (MS&T14), Pittsburgh, PA, October 14, 2014.
49. JS McCloy,* "Alumino-silicate minerals and their importance for nuclear waste management," *Invited* presentation at the Washington State University/ University of Idaho School of the Environment seminar series, Pullman, WA, October 2, 2014.
50. JS McCloy,* "Technetium challenges: Waste forms," *Invited* presentation at the EMSL Radiochemistry Annex Workshop, Richland, WA, July 24, 2014.
51. JS McCloy,* Jamie Weaver, Jose Marcial "Advanced characterization of crystallization and corrosion in complex silicate glasses," *Invited* poster presentation at Corning Glass Research Summit, Corning, NY, June 12, 2014.
52. JS McCloy* "Advanced magnetic methods for monitoring nuclear reactor structural materials," *Invited* speaker at Materials Advantage seminar, University of Idaho, Moscow, ID, April 24, 2014.
53. JS McCloy* "Spin Disorder in Magnetic Materials," *Invited* speaker at Physics Colloquium, University of Idaho, Moscow, ID, October 14, 2013.
54. JS McCloy* "Advanced Magnetic Methods for Understanding and Monitoring Nuclear Reactor Pressure Vessel Aging," *Invited* speaker at Materials Science & Engineering Program seminar, Washington State University, Pullman, WA, October 4, 2013.
55. JS McCloy* "Advanced Materials for Environmental and Sensing Applications," *Invited* speaker at special seminar for Washington State University, School of Mechanical and Materials Engineering, Pullman, WA. April 8, 2013.
56. JS McCloy* "Materials Archaeology: a Bricolage of Glass and Stone," *Invited* speaker at special seminar for Massachusetts of Technology, Department of Materials Science & Engineering, Cambridge, MA, March 19, 2013.

2010-2012

57. JS McCloy,* W Jiang, CL Warner, and MG Warner. "Measurements and Applications of Magnetic Nanoparticles." *Invited* Speaker at special seminar, Arizona State University, Department of Chemical Engineering, Tempe, AZ, November 2, 2011.
58. JS McCloy.* "Effects of Ionizing Radiation on Electromagnetic Materials Relating to Sensing for Nuclear Applications." *Invited* Speaker at Ohio State University, Nuclear Engineering/ Physics special seminar, Columbus, OH, October 18, 2011.
59. JS McCloy.* "Novel Radiation Detector Devices and Materials Based on Electromagnetic Property Changes." *Invited* Speaker at special seminar, Clemson University, South Carolina, Clemson, SC, June 28, 2011.
60. J. S. McCloy,* M. J. Schweiger, C. Rodriguez, A. Winschell. "Optical basicity as an indicator for nepheline formation in high-level waste glasses." *Invited* Poster presentation for DOE-EM Waste Processing Technical Exchange, Atlanta, GA, November 2010.
61. John McCloy,* "Optical Basicity Revisited." *Invited* speaker, American Ceramic Society Glass and Optical Materials Division Meeting, Corning, NY, May 2010.

OTHER SELECTED PRESENTATIONS (public, *no proceedings*; *presenter, recent 1st)

2019-2023

62. John S. McCloy,* Sam Karcher, Brooke Downing, "Laser induced luminescence imaging: Microstructural-Chemical Analysis for Nuclear Materials" 47th Scientific Basis for Nuclear Waste Management, Materials Research Society, Köln, **Germany**, Nov 7, 2023.
63. John S. McCloy,* Ashutosh Goel, Albert Kruger, "Advances in Fundamental Understanding of Hanford Glass Composition-Properties-Processing Relations," ASME International Conference on Environmental Remediation and Radioactive Waste Management (ICEM), Stuttgart, **Germany**, Oct 4, 2023.
64. John S. McCloy,* Rubi Gul, Magesh Murugesan, Marc Weber, Santosh Swain, Saketh Kakkireni, Samuel Bigbee-Hansen, "II-VI Materials Growth and Characterization at the WSU IMR," 2021 U.S. Workshop on the Physics and Chemistry of II-VI Materials, Chicago, IL, Oct 27, 2021.
65. J. McCloy*, Brian Riley, Saehwa Chong. "Iodine Waste Forms: Review and Contributions of Dr. Lou Vance," Materials Research Society Symposium on Scientific Basis for Nuclear Waste Management (MRS SBNWM), Virtual, Nov 30, 2020.
66. J. McCloy,* "Vitrified Hillforts: Ancient Buildings of Glass from Stone" The 13th Pacific Rim Conference of Ceramic Societies (PACRIM13), Okinawa Convention Center, **Japan**, Oct 30, 2019.
67. J. McCloy*, et al. "Analogue Studies for Long-term Durability of Nuclear Waste Glasses: Case Study of Vitrified Swedish Hillfort," 43rd Materials Research Society Symposium on Scientific Basis for Nuclear Waste Management (MRS SBNWM), Vienna International Centre, **Austria**, hosted by the International Atomic Energy Agency (IAEA), Oct 23, 2019.
68. J. McCloy* and Hua Chen, "Rare earth environments in silicate, borate, borosilicate, and transition metal phases obtained from glass-ceramics," 9th European Conference on Mineralogy and Spectroscopy (ECMS 2019), Prague, **Czech Republic**, Sept 13, 2019.

2017-2018

69. J. McCloy*, et al. "Spectroscopic studies of alkali pertechnetates and pertechnic acid," 10th International Symposium on Technetium and Rhenium Science & Utilization (ISTR2018), Moscow, **Russia**, Oct 2018.
70. J McCloy,* J. Marcial, et al. "Effects of Li, Ca, Fe, and B on $NaAlSiO_4$ nepheline crystallization in high level waste glasses," Scientific Basis for Nuclear Waste Management, Materials Research Society, Sydney, **Australia**, Oct 2017.
71. J McCloy,* S. Chong, et al. "Characterization of Sodalite Based Waste Forms for Immobilization of ^{129}I," Scientific Basis for Nuclear Waste Management, Materials Research Society, Sydney, **Australia**, Oct 2017.
72. J McCloy,* J. Clark, et al. "Reconstructing Vitrified Wallbuilding Technology for Broborg Hillfort Site, Sweden," Advances in Geoarchaeology, Geological Society of America, Seattle, WA, Oct 2017.
73. J. McCloy,* et al, "Reconstructing Vitrified Wallbuilding Technology for Broborg Hillfort Site, Sweden," Nuclear Waste Technical Review Board, Richland, WA, June 2017.
74. Erik Fergerstrom, Jose Marcial, John McCloy, "Glass technology and use in ancient Byzantine Turkey: color, composition, deterioration, and field identification of glass at Çadir Höyük," Poster presentation at American Ceramic Society PACRIM12/Glass and Optical Materials Division meeting, Waikoloa, HI, May 2017.

2013-2016

75. J McCloy,* H Meredith, E Fergerstrom "Contextualising Çadir Höyük: a cross-disciplinary investigation into use patterns and long-term glass alteration," Materials Science and Technology (MS&T), Salt Lake City, UT, Oct 2016.
76. J McCloy,* et al. "Swedish Vitrified Forts: Ironmaking, Building Technology, & Long-Term Glass Degradation," Materials Science and Technology (MS&T), Salt Lake City, UT, Oct 2016.
77. J. McCloy,* "In-situ Crystallization Experiments of Nuclear Waste Glass Ceramics," Society for Glass Technology Centenary Conference, Sheffield, **UK**, September 2016.
78. A. Deshkar, J. McCloy*, J. Marcial, D. Bryce, S. Southern, L. Kobera, A. Goel, "Structural dependence of crystallization in nepheline ($Na_2O•Al_2O_3•2SiO_2$) based glasses," American Ceramic Society Glass and Optical Materials Division (GOMD) meeting, Madison, WI, May 2016.
79. MT Singh, JS McCloy, R Kukkadapu, and Y Qiang,* "Spectral study of oxide-shell in core-shell iron nanoclusters," extended abstract, IEEE INTERMAG Conference, Beijing, China, 2015 http://dx.doi.org/10.1109/INTMAG.2015.7157445.
80. John S. McCloy*, Nancy Washton, Paul Gassman, Jose Marcial, Jamie Weaver, Ravi Kukkadapu, "Nepheline crystallization in boron-rich alumino-silicate glasses as investigated by multi-nuclear NMR, Raman, & Mössbauer spectroscopies," American Ceramic Society Glass and Optical Materials Division (ACerS-GOMD) – Deutsche Glastechnische Gesellschaft (ACerS-GOMD) joint meeting, Miami, FL, May 2015.
81. JS McCloy,* BJ Riley, MJ Schweiger, D-S Kim, C Iovin, WW Lukens, "Incorporation of large fractions of iodine in borosilicate glass," Deutsche Glastechnische Gesellschaft (DGG) – American Ceramic Society Glass and Optical Materials Division (ACerS-GOMD) joint meeting, Aachen, **Germany**, May 2014.

82. JS McCloy,* M Schweiger, C Soderquist, D Kim, W Lukens, P Gassman, E Buck, B Riley. "Technetium solubility in borosilicate nuclear waste glasses – progress report." 10th Pacific Rim Conference on Ceramic and Glass Technology, San Diego, CA, June 2013.

2008-2012

83. D. Strachan,* JV Ryan, JS McCloy, D Schreiber, DP Jansik, DR Dixon, JV Crum "The Use of Ancient Glasses in Understanding the Mechanism for Glass Dissolution Disposal," Materials Science and Technology (MS&T), Pittsburgh, PA, Oct 2012.
84. JS McCloy,* BJ Riley, CF Windisch, Jr, CP Rodriguez, A Lipton, N Washton, M Olstza, and JD Vienna. 2011. "Role of chloride in TeO_2-PbO-XCl glass structure." 2012 Glass & Optical Materials Division Spring Meeting, St. Louis, MO, May 2012.
85. JS McCloy,* A Goel, DS Kim, MJ Schweiger, BJ Riley, PR Hrma, AA Kruger, M Liezers, CF Windisch, Jr, and CP Rodriguez. 2012. "Rhenium solubility in borosilicate glasses." 2012 Glass & Optical Materials Division Spring Meeting, St. Louis, MO, May 2012.
86. SK Sundaram,* RJ Koch, and JS McCloy. 2012. "Terahertz Properties of Single-Crystal Ferroelectric and Dielectric Materials." SPIE Defense, Security and Sensing, Baltimore, MD, April 23, 2012.
87. J. McCloy,* C. Leslie, W. Jiang, B. Johnson, J. Crum, T. Kaspar, G. Exarhos, T. Droubay. "Glassy magnetic behavior in disordered Ni,Co:$CuMn_2O_4$ spinels." American Ceramic Society Glass and Optical Materials Division, Savannah, GA, May 2011.
88. B. Johnson,* J. McCloy, B. Riley, J. Crum, J. Ryan, S. Sundaram, D. Herbert, A. Rocket, "Electrical transport properties of bulk amorphous semiconductors." American Ceramic Society Glass and Optical Materials Division, Savannah, GA, May 2011.
89. Jiang W, JS McCloy, AS Lea, JA Sundararajan, Q Yao, and Y Qiang.* "Magnetic phase transition of ion irradiated granular magnetite films." IEEE International Magnetics Conference, Taipei, Taiwan, Province Of China, April 2011.
90. S. Sundaram,* JS McCloy, MK Murphy, HA Qiao, CF Windisch, Jr, and BJ Riley. "Gamma Radiation Effects on Optical Properties of Binary As-S glasses." Materials Science and Technology (MS&T) 2010, Houston, TX, October 2010.
91. John McCloy,* Tim Droubay, Eric Walter, Brian Riley, "Spin Glasses, with emphasis on Cadmium Manganese Telluride." American Ceramic Society Glass and Optical Materials Division, Corning, NY, May 2010.
92. John McCloy,* Jarrod Crum, S. K. Sundaram, "Millimeter-wave sensor development for coal gasification." Poster presentation at Pittsburgh Coal Conference, Pittsburgh, PA, September 2009.
93. Hong Qiao,* John McCloy, Brad Johnson, Nathan Carlie, Norm Anheier. "Film Adhesion in Thick Chalcogenide Films." 8th Pacific Rim Conference on Ceramic and Glass Technology, Vancouver, BC, Canada, May 2009.
94. S. K. Sundaram,* John McCloy, Jarrod Crum. "Sensor Concepts and Development for Coal Gasification." 25th International Pittsburgh Coal Conference, Pittsburgh, PA, October 2008.

2005-2008

95. C. Scott Nordahl,* Todd Gattuso, Tom Hartnett, Rick Gentilman, John McCloy, W. Howard Poisl, and Chuck Willingham, "Characterization of Nanocomposite Optical Ceramics." 32nd International Conference on Advanced Ceramics and Composites, Daytona, FL, January 2008
96. John McCloy,* Todd Stefanik, Rick Gentilman. "Sub-micron Grained Transparent Yttria-based Optical Composite Ceramics." Materials Science & Technology (MS&T) '07, Detroit, MI, September 2007.
97. John McCloy.* "Current and Future Technologies for Missile Domes." Advances in Optical Materials (AIOM), Tucson, AZ, October 2005.

SERVICE

UNIVERSITY SERVICE

See section under Experience: WSU: University Service

ADVISORY BOARDS

- Western Washington University (WWU) Advanced Materials Science & Engineering Center (AMSEC) External Advisory Board, 2020-

PROFESSIONAL SOCIETIES

1. American Ceramic Society (2007 – present), **Fellow**
    a. Glass and Optical Materials Division (GOMD); Art, Archaeology, & Conservation Sciences (AACS) Division; Nuclear and Environmental Technology Division (NETD)

b. Conference chair "Glass and Optical Materials Division" annual meeting for American Ceramic Society, at 11th PACRIM, San Diego, CA, 2013
c. Conference chair "Glass and Optical Materials Division" at MS&T 2015, Columbus, OH, 2015.
d. Conference co-chair "Art and Cultural Heritage" at MS&T 2018, Columbus, OH, 2018.
e. Member, executive committee: Art, Archaeology, & Conservation Division (2014 – present); Chair 2017-18
f. Member, editorial advisory board: *American Ceramic Society Bulletin* (2014 – present); Chair 2016-17

2. SPIE - Society of Photo-optical Instrumentation Engineers (2004 – present), **Senior Member**
   a. http://spie.org/app/profiles/viewer.aspx?profile=ZAUBNX
   b. Organizing committee member "Windows and Domes Technology and Materials" symposium for SPIE, 2007, 2011, 2013, 2015, 2019.
3. Sigma Xi (1996 – present): Scientific Research Society, Full Member
   a. Chapter Vice-President 2011-2013
4. Materials Research Society (MRS) (2014 – present)
   a. Organizing committee, Scientific Basis for Nuclear Waste Management, MRS Fall 2018 meeting, Boston, MA
5. American Chemical Society (ACS) (2016 – present)
   a. Organizing committee member "Waste Forms for Environmental Remediation" for American Chemical Society, Division of Industrial and Engineering Chemistry, 243rd ACS national meeting, San Diego, CA, 2012.
6. American Association for the Advancement of Science (AAAS) (2014 – present)
7. Society for Glass Technology (SGT), UK glass society (2016 – present)
8. Mineralogical Society of America (MSA) (2015 – present)
9. American Association of Crystal Growth (AACG) (2023 – present)
10. American Society of Mechanical Engineers (ASME) (2023 – present); nuclear division, materials division
11. ASM International (2015 – 2018)
12. The Minerals, Metals & Materials Society (TMS) (2015 – 2018)
13. Association for Iron and Steel Technology (AIST) (2015 – 2018)
14. American Society of Engineering Education (ASEE) (2015 – 2016)

Other Conference organization

b. Organizing committee member "DOD Electromagnetic Windows" symposium, 2010.
c. International advisory committee, "International Symposium on Technetium and Rhenium Science and Utilization," 2018-

PEER-REVIEWED JOURNAL EDITOR AND REFEREE

Editor

- **MRS Advances. Associate Editor (2019-2022); Principal Editor (2018)**
- Frontiers in Materials – Glass Science. Editorial Board: Review Editor (2014 – 2018)
- Bulletin of the American Ceramic Society. Editorial Advisory Board (2014-17)
- Bulletin of the American Ceramic Society. Chair, Editorial Advisory Board (2016-17)

Referee for >150 articles in ~50 different journals:

1. *10+ reviews:*
   - *Journal of Nuclear Materials (Elsevier), MRS Advances (MRS), Journal of Physical Chemistry (ACS), Optical Materials Express (OSA), Journal of the American Ceramic Society (Wiley)*
2. *5-10 reviews:*
   - *Journal of Non-crystalline Solids (Elsevier), Journal of Materials Science (Springer), International Journal of Applied Glass Science (Wiley)*
3. *2-4 reviews:*

- *Journal of Alloys and Compounds (Elsevier), Journal of Crystal Growth (Elsevier), American Mineralogist (MSA), Applied Materials & Interfaces (ACS), Inorganic Chemistry (ACS), Crystal Growth and Design (ACS), Materials (MDPI), Journal of Applied Physics (AIP), Applied Physics Letters (AIP)*

4. *1 review:*
   - *Journal of Vacuum Science & Technology A (AVS), Journal of Hazardous Materials (Elsevier), Journal of the European Ceramic Society (Elsevier), Physica Status Solidi Rapid Research Letters (Wiley), Journal of Raman Spectroscopy (Wiley), Archaeometry (Wiley), Physica Status Solidi B (Wiley), Dalton Transactions (ACS), Materials Today Physics (Elsevier), Corrosion Science (Elsevier), Microporous and Mesoporous Materials (Elsevier), Journal of Physics and Chemistry of Solids (Elsevier), Geochemistry (Elsevier), Journal of Luminescence (Elsevier), Journal of Magnetism and Magnetic Materials (Elsevier), Radiation Physics and Chemistry (Elsevier), Infrared Physics (Elsevier), Thin Solid Films (Elsevier), Precision Engineering (Elsevier), Journal of Cleaner Production (Elsevier), Arabian Journal of Chemistry (Elsevier), Physica B (Elsevier), Vibrational Spectroscopy (Elsevier), Ceramics International (Elsevier), Materials Science & Engineering C (Elsevier), Environmental Pollution (Elsevier), Journal of Electronic Materials (Springer), Environmental Science & Technology (ACS), Optical Engineering (SPIE), Chinese Optics Letters (OSA), Science and Technology of Advanced Materials (IOP), Chromatography (MDPI), Geosciences (MDPI), Journal of Biomedical Technology and Research (Elyns), Frontiers in Materials - Glass Science (Nature Group), High Temperatures-High Pressures (Old City); ACS ES&T Engineering (ACS); Journal of Radiological and Nuclear Chemistry (Springer), Comptes Rendus Geoscience (French Academy of Sciences); Journal of Materials Chemistry C (RSC)*

PROPOSAL AND PROJECT REVIEWER

- Department of Energy – National Nuclear Security Agency
- Department of Energy – Office of Nuclear Energy (program: NEUP)
- Department of Energy – Office of Science (program: SBIR/STTR)
- Department of Defense – Defense Threat Reduction Agency
- National Science Foundation – DMR Ceramics
- Deutsche Forschungsgemeinschaft - DFG (German Research Foundation)
- Stanford Synchrotron Radiation Lightsource (SSRL) – user proposals
- Fulbright fellowships – US-UK Commission

FUNDING

Washington State University

Unless otherwise noted, when lead organization is WSU, Prof. McCloy is Principal Investigator (PI). When lead organization is other, Prof. McCloy is co-PI of program. Parentheses shows WSU portion or McCloy portion if not equal to the first number.

CURRENT:

#	SUPPORTING AGENCY	AWARD AMOUNT (WSU)	EFFECTIVE/ EXPIRATION DATES	PROJECT TITLE	LEAD ORGAN.
C1	Department of Energy – Office of River Protection (89304022CEM000015)	$1,263,531 ($633,352)	1/2022 – 9/2024	Glass Research Providing Risk Reduction for DF-LAW Vitrification Plant Startup	WSU
C2	Lawrence Livermore National Security, LLC (DE-AC52-07NA27344)	$1,003,949	1/2022 – 9/2024	Growth and characterization of photoconductive β-Ga_2O_3 crystals	LLNL
C3	DOE Advanced Research Projects Agency–Energy (ARPA-e) (DE-AR0001614)	$600,000	7/2022 – 6/2025	Pioneering a Cermet Waste Form for Disposal of Waste Streams From Advanced Reactors (PACE-FORWARD)	Rutgers
C4	Department of Energy – Nuclear Energy (S003474USDOE)	($47,811)	10/2022 – 9/2025	A Molten Salt Community Framework for Predictive Modeling of Critical Characteristics	Penn state
C5	Nuclear Regulatory Commission (NRC) (31310023M0011)	$500,000 ($200,070)	12/2022 – 11/2025	Characterization of fresh and spent nuclear fuel for nuclear power plants: Understanding of Degradation Pathways and Thermodynamic Properties of UN and UC based Spent Nuclear Fuels from Pool Storage and Dry Disposal	WSU
C6	Vanderbilt University (via Consortium for Risk Evaluation with Stakeholder Participation, CRESP: US DOE – Office of Environmental Management)	($102,676)	1/2023 – 12/2023	Iron sulfide nanoparticles for capture of volatile contaminants	Vanderbilt
C7	National Science Foundation (DMR-2235208)	($81,225)	4/2023 – 3/2025	FuSe-TG: Co-Design of Germanium Oxide-based Semiconductors from Deposition to Devices	Drexel & others
C8	U.S. Army Contracting Command – Aberdeen Proving Ground – Research Triangle Park Division (W911NF-23-2-0087)	$4,000,000 ($692,086)	4/2023 – 4/2024	Accelerated Discovery, Design, and Development of Ceramic Materials	WSU
C9	Missile Defense Agency SBIR Phase 2	($399,312)	7/2023 – 6/2025	Innovative Equipment Large Single-Crystal CdZnTe Production for Long-wave Infrared Detector Arrays	SMI
C10	DOE-EERE Solar Energy Technology Office SBIR Phase 2 (DE-SC0022812)	($199,916)	9/2023 – 8/2025	Commercial Production of the Group-V Doped Polycrystalline CdTe Source Material for the Next-Generation Photovoltaics	RDT, CSU
C11	National Institute of Health SBIR Phase 2 (R44EB029280)	($474,772)	9/2023 – 7/2025	The Rapid-Production of the High-Performance and Affordable Cadmium Telluride and Cadmium Zinc Telluride for Medical Imaging Applications	RDT, UofA
C12	National Renewable Energy Laboratory, Cadmium Telluride Acceleration Consortium, US DOE	$281,392	11/2023 – 10/2025	Optimizing Iodine-doped CdTe for Potential n-type Solar Cells	NREL

COMPLETED:

#	SUPPORTING AGENCY	AWARD AMOUNT (WSU)	EFFECTIVE/ EXPIRATION DATES	PROJECT TITLE	LEAD ORGAN.
1	Department of Energy – Nuclear Energy	$1,000,000 ($303,363)	10/2013 – 09/2016	Use of Micro- and Meso-scale Magnetic Characterization Methods to Study Degradation of Reactor Structural Material https://neup.inl.gov/SiteAssets/FY%202013%20Abstracts/NEET/73-Pacific%20Northwest%20National%20Laboratory.pdf	PNNL
2	Department of Energy – Office of River Protection (DE-EM0002904)	$821,141	01/2014 – 12/2017	Compositional dependence of glass corrosion due to nepheline formation https://www.fbo.gov/index?s=opportunity&mode=form&tab=core&id=77656969c6e46864417f7aa183193a59	WSU
3	Department of Energy – Nuclear Energy (DE-NE0008257)	$800,000 ($301,368)	10/2014 – 09/2017	Apatite and sodalite based glass-bonded waste forms for immobilization of ^{129}I and mixed halide radioactive wastes https://neup.inl.gov/SiteAssets/FY%202014%20Abstracts/R_D/FC6-Rutgers.pdf	Rutgers
4	Department of Energy – Nuclear Energy (DE-NE0008431)	$799,911 ($334,911)	10/2015 – 09/2018	Understanding influence of thermal history and glass chemistry on kinetics of phase separation and crystallization in borosilicate glass-ceramic waste forms for aqueous reprocessed high level waste https://neup.inl.gov/SiteAssets/FY%202015%20Abstracts/R_D/NEUP_Attachments_Proposal_CFA-15-8081_Filtered.pdf	WSU
5	Department of Energy – Nuclear Energy (DE-NE0008597)	$3,000,000 ($660,000)	10/2016 – 09/2019	Understanding fundamental science governing the development and performance of nuclear waste glasses https://neup.inl.gov/FY16%20Abstracts/IRP/IRP-16-10925_TechnicalAbstract_2016CFATechnicalAbstractIRP-16-10925.pdf	Rutgers
6	Department of Defense – Defense Microelectronics Activity (DMEA) - Small Business Technology Transfer (STTR) Phase I	$150,000 ($75,000)	4/2016 – 10/2016	ZnS Scintillator for High Resolution X-ray Imaging at 9 keV https://www.sbir.gov/node/1250547	Ceranova, Inc.
7	Department of Energy - Small Business Technology Transfer (STTR) Phase I	($36,592)	07/2019 - 03/2020	Commercialization of Rapid-Production Growth Method for Affordable Cadmium Zinc Telluride (CZT) Semiconductor [inherited 2020 w/ IMR] https://www.sbir.gov/sbirsearch/detail/1640503	Radiation Detection Technologies, Inc. (RDT)
8	Emirates Global Aluminum	($109,598 – McCloy share)	5/2018 – 12/2019	Conversion of common DSP minerals into 2:1-type clay minerals	WSU (McCloy is co-PI)
9	Department of Energy – Nuclear Energy (DE-NE0008689)	$800,000 ($640,000)	10/2017 – 9/2020	Simulated Used Nuclear Fuel Dissolution as a Function of Fuel Chemistry and Near Field Conditions https://neup.inl.gov/FY17%20Abstracts/CFA-17-13054_TechnicalAbstract_2017CFATechnicalAbstract17-13054.pdf	WSU
10	DOE-EERE-SETO Small Innovate Projects in Solar (SIPS) (DE-EE0008548)	$130,388	02/2019 - 12/2020 (NCE)	Preparation and evaluation of n-type CdSeTe as an absorber in thin film CdTe PV [inherited in 2020 w/ IMR] https://www.energy.gov/sites/prod/files/2018/12/f58/101278.pdf	WSU

11	National Institutes of Health (NIH) National Institute of Biomedical Imaging &Bioengineering (NIBIB) - Small Business Technology Transfer (STTR) – Phase I (1R41EB029280-01)	($45,752)	09/2019-04/2021 (NCE)	The Rapid-Production of the High-Performance and Affordable Cadmium Telluride and Cadmium Zinc Telluride for Medical Imaging Applications [inherited 2020 w/ IMR] https://www.sbir.gov/sbirsearch/detail/1685697	Radiation Detection Technologies, Inc. (RDT)
12	JCDREAM (Joint Center for Deployment and Research in Earth Abundant Materials)	$25,000	9/2020 – 6/2021	Supply Chain Data Science - Critical Materials Decision Support System Based on Machine Learning: Battery Materials Case Study	WSU
13	Department of Defense Air Force Office of Scientific Research Laboratory (AFOSR) Multidisciplinary University Research Initiative (MURI) (FA9550-18-1-0507)	($269,214)	09/2018 – 09/2021	Fundamentals of Doping and Defects in Ga_2O_3 for High Breakdown Field Electronics [inherited in 2020 w/ IMR] https://community.apan.org/wg/afosr/w/researchareas/22945/fundamentals-of-doping-and-defects-in-ga2o3-for-high-breakdown-field/	U. Utah
14	Department of Energy – Energy Efficiency & Renewable Energy (EERE), Solar Energy Technology Office (SETO) (DE-EE0007537)	$1,073,478 (w/o cost share)	08/2016 – 08/2021	Developing a low cost, high volume and scalable manufacturing technology for undoped and heavily p-type doped CdTe feedstock materials [inherited in 2020 w/ IMR] https://www.energy.gov/nepa/downloads/cx-100683-categorical-exclusion-determination	WSU
15	Department of Energy – Nuclear Science User Facilities (NSUF) (DE-NE0009027)	$324,900	01/2021 – 12/2021	Laboratory-based High-Resolution X-ray Absorption and Emission Spectroscopy for Nuclear Science and Radiochemistry Research and Education https://neup.inl.gov/FY%202020%20CINR%20Abstracts/GSI-20-19067_TechnicalAbstract_FY2020SummaryAbstractGSI-20-19067.pdf	WSU (Co-PI)
16	Department of Energy – Office of River Protection (89304017CEM000001)	$1,724,218	1/2018 – 12/2021	Special studies and analysis of compositional dependence of glass corrosion due to nepheline formation https://www.fbo.gov/index?s=opportunity&mode=form&id=3b3e943dba1198254d87646ef1dc854d&tab=core&_cview=0	WSU
17	Missile Defense Agency SBIR Phase I (HQ086022C7510)	$48,622	12/2021 – 6/2022	Innovative Equipment Large Single-Crystal CdZnTe Production for Long-wave Infrared Detector Arrays	SMI
18	Department of Energy - Defense Nuclear Nonproliferation Research and Development Office (DNN R&D), Small Business Technology Transfer (STTR) – Phase 2 (DE-SC0020023)	($444,328)	09/2020 - 08/2022	Commercialization of Rapid-Production Growth Method for Affordable Cadmium Zinc Telluride (CZT) Semiconductor https://www.sbir.gov/sbirsearch/detail/1869443	Radiation Detection Technologies, Inc. (RDT)
19	DOE-EERE-SETO Small Innovate Projects in Solar (SIPS) (DE-EE0009365)	$299,912 ($189,912)	3/2021 – 8/2022 (NCE)	Developing CdTe homojunctions applying high throughput deposition (https://www.energy.gov/nepa/downloads/cx-102003-developing-cdte-homojunctions-applying-high-throughput-deposition)	WSU
20	Department of Energy – Nuclear Energy (DE-NE0008964)	$400,000 ($320,000)	10/2020 – 9/2022	Separated waste stream immobilization of iodine and offgas caustic scrubber solution https://neup.inl.gov/FY%202020%20CINR%20Abstracts/CFA-20-19382_TechnicalAbstract_2020CFATechnicalAbstract20-19382.pdf	Rutgers
21	DOE Office of Science STTR Phase 1 (DE-SC0022812)	$199,842 ($60,958)	6/2022 – 3/2023	Commercial Production of the Group-V Doped Polycrystalline CdTe Source Material for the Next-Generation Photovoltaics	Radiation Detection Technologies

22	Department of Defense Air Force Office of Scientific Research Laboratory (AFOSR) Multidisciplinary University Research Initiative (MURI) (FA9550-21-1-0078)	($893,858)	10/2021 – 12/2023	CONTINUATION: Fundamentals of Doping and Defects in Ga_2O_3 for High Breakdown Field Electronics	U. Utah

SUCCESSFUL USER PROPOSALS AT NATIONAL USER FACILITIES

- ANL Advanced Photon Source (APS)
  - GUP-67838, "In situ diffraction studies of mixed anion liquids," Beamline 6-ID-D. 2020.
  - GUP-60502, "In situ diffraction studies of mixed anion liquids," Beamline 6-ID-D. 2018.
  - GUP-54910, "Crystallization mechanism of glasses on cooling from melt of glasses from high temperature," Beamline 6-ID-D. 2017.
  - GUP-52292 "Compositional influence of model glass crystallization as analogues for High-level nuclear waste (HLW) glasses," Beamline 11-ID-B. 2016.
  - GUP-48440 "Molecular Structure of ^{99}Tc During Nuclear Waste Vitrification," Beamline 12-BM. 2016-17.
- SOLEIL synchrotron (France)
  - #20181647 "Effect of temperature and redox conditions on K-edge XANES spectra of Fe: an in-situ study of glasses along the $NaAlSiO_4$-$NaFeSiO_4$ join," Beamline ODE. 2018.
- Stanford Synchrotron Radiation Lighthouse (SSRL)
  - #4603 "Investigating reductive immobilization of ^{99}Tc in iron spinels for long term storage of nuclear waste," Beamline 11-2, Beamline 4-1. 2017.
- ORNL Spallation Neutron Source
  - #IPTS-26058.1 "Periodicity evaluation of Iron Phosphate and Lead Telluride glasses for immobilization of halogenated nuclear waste," BL-1B NOMAD. 2020.
  - #IPTS-21702.1 "Structural Characterization of 4+ Cation Doped $NaAlSiO_4$ Glass," BL-1B NOMAD. 2019.
  - #IPTS-20452.1 "Exploring oxidation of UO_2 with Neutron Vibrational Spectroscopy," BL-16B VISION. 2018.
  - #IPTS-17308: "In situ high temperature glass ceramic experiment development (proof of concept)," BL-1B NOMAD. 2017.
  - #IPTS-15451.1: "Powder Neutron Diffraction Study of Lithium ^{99}Tc oxides and Tc-Bearing Nuclear Waste Glasses," BL-1B NOMAD. 2016.
  - #IPTS-15446.1: "SANS and ND for Phase Evolution on Cooling of Nuclear Waste Glass Ceramic Melts," BL-1B NOMAD. 2016.
  - #IPTS-14670.1: "Large Q-range structure of Glassy and Crystalline Aluminosilicates (proof of concept)," BL-1B NOMAD. 2015.
  - #IPTS-12371.1: "Powder Neutron Diffraction study of the Local Structure of Novel Alkali Oxides of ^{99}Tc," BL-1B NOMAD. 2015.
- ORNL High Flux Isotope Reactor
  - #IPTS-12372.1: "High Temperature ND and SANS for Eliciting Amorphous Phase Separation and Crystallization data on Nuclear Waste Glass Ceramics," GP-SANS. 2015.
- PNNL Environmental Molecular Sciences Laboratory (EMSL)
  - Science Theme #51400: "Past is Prologue: Ancient Glass Analogues for the Long-Term Disposal of Vitrified Nuclear Waste," 2020
  - Science Theme #48294: "Characterization of the Local Structure and Chemistry of ^{99}Tc in Simulated Nuclear Waste Glasses and its Effect on Chemical Leaching," 2014-2016.
  - General proposal #s 48571, 49202, "Meso-scale Magnetic Signatures for Nuclear Reactor Steel Irradiation Embrittlement Monitoring," 2014-2016.
  - General proposal #39968, "Nepheline Formation in High Level Waste Glass," 2013.
  - General proposal #47655, "Electrical and Photoelectrochemical Characterization of Single Crystal Bismuth Vanadate," 2012.

- General proposal #46403, "Interfacial Investigations of Nuclear Waste Forms," 2012.
- General proposal #44713, "Microstructures and Their Stability of Ion-implanted Energy and Storage Materials," 2011.
- General proposal #42302, "Radiation-induced Property Changes in Magnetic Materials," 2010-2011.
- General proposal #37511, "Chalcogenide surface science," 2009.

PROFESSIONAL REFERENCES

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