

# John S. McCloy

## 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](mailto:john.mccloy@wsu.edu); [jsmccloy@alum.mit.edu](mailto:jsmccloy@alum.mit.edu)

<http://john.mccloy.info/index.html>

<http://www.mme.wsu.edu/people/faculty/faculty.html?mccloy>

<http://labs.wsu.edu/mccloy/>

### Present Employment

**Washington State University, Pullman, WA (7/13 – present)** ([details attached](#))

*Associate Professor, Materials Science*

School of Mechanical and Materials Engineering, College of Engineering & Architecture

### Previous Positions

**Pacific Northwest National Laboratory, Richland, WA (6/08 – 7/13)** ([details attached](#))

*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)** ([details attached](#))

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

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

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

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

*Process Engineer II*

**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*

### Education

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

Title of dissertation: Processing and Properties of Chemical Vapor Deposited Zinc Sulfide

<http://arizona.openrepository.com/arizona/handle/10150/194010?mode=simple>

Advisor: Professor Donald Uhlmann; Co-Advisor: Professor B. G. Potter

**Department of Materials Science & Engineering, College of Engineering, University of Arizona, Tucson, AZ** (GPA 4.0/4.0)

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

**Department of Materials Science & Engineering, College of Engineering, University of Arizona, Tucson, AZ** (GPA 4.0/4.0)

M.A. Cultural Anthropology, (May 2004)

Title of thesis: Corporate and Occupational Culture in a Southwest Defense Company

Certificate of Medical Anthropology

**School of Anthropology, College of Social & Behavioral Sciences, University of Arizona, Tucson, AZ** (GPA 4.0/4.0)

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

Minor in Archaeology/ Anthropology

**Department of Materials Science & Engineering, School of Engineering, Massachusetts Institute of Technology** (GPA 4.8/5.0)

### Research Interests

Advanced ceramic and metallic materials; advanced characterization methods; structure – property relationships in glasses; magnetic oxide ceramics; magnetic characterization methods; infrared-transmitting ceramics; glasses, ceramics, glass-ceramics for nuclear waste immobilization; radiation effects in materials; lime, gypsum and building materials; development of materials technologies

## Awards/Honors

- Delegate to National Academy of Engineering activities, 2013, 2015
- Adjunct faculty member, Washington State University, Tri-Cities, 2011-2013
- Sigma Xi, full member, 2010
- PNNL Scientist & Engineer Development Program, 2010-2011.
- Michael C. Weinberg memorial scholarship, University of Arizona, 2007-8.
- Society of Photo-optical Instrumentation Engineers (SPIE) scholarship award, 2007.
- Peer-voted “with Honors” designations at Raytheon, 2005, 2007.

## Professional Service

- Referee for 18 International Journals
- Member, American Ceramic Society
- Member, SPIE – Society of Photo-optical Instrumentation Engineers
- Chapter Vice-President (2011-2013), Sigma Xi – Scientific Research Society
- Organizing committee for symposia: “Department of Defense Electromagnetic Windows” (2010); “SPIE Windows and Domes Technology & Materials (2009, 2011, 2013, 2015); “American Chemical Society, Waste Forms for Environmental Remediation” (2012)
- Conference chair “Glass and Optical Materials Division” annual meeting for American Ceramic Society, at 11th PACRIM, San Diego, CA (2013); “Glass and Optical Materials Division” meeting for American Ceramic Society, at MS&T, Columbus, OH (2015)

## Research Publications

- International peer-reviewed journal articles: 57
- Books: 1
- Conference proceedings papers: 20
- Technical reports (public): 23
- Patents: 3  
([details attached](#))

## Presentations

- Conference oral presentations: >50
- Invited talks (public): 15  
([details attached](#))

## Advisor/Supervisor

- Graduate and undergraduate students at Washington State University (2013 –)
- Team lead for 17 research staff and students in glass and materials science at Pacific Northwest National Laboratory (2010 – 2013)

## Teaching Experience

- WSU MSE302 “Electronic Materials”– Fall 2013, Fall 2014
- WSU MSE403 “Ceramic Materials”– Spring 2014
- WSU MSE571 “Materials Characterization”, MSE110 “Intro. Materials Science” - Guest lectures (2013-15)
- Teaching Assistant (Materials Science), Massachusetts Institute of Technology (1996-7)
- Raytheon training course “Infrared Materials and Dome Design” (2004-8)  
([details attached](#))

## Citizenship

- United States

# JOHN S. McCLOY, PhD

## **CONTACT INFORMATION**

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John S. McCloy

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<http://www.mme.wsu.edu/people/faculty/faculty.html?mccloy>

[http://www.researchgate.net/profile/John\\_Mccloy/](http://www.researchgate.net/profile/John_Mccloy/)

<http://www.linkedin.com/pub/john-mccloy/33/26/773>

<http://john.mccloy.info/index.html>

<http://labs.wsu.edu/mccloy/>

## **SUMMARY**

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Highly adaptive scientist & engineer with >15 years' experience in industry aerospace/ defense and national laboratory, now transitioned to academia. Current professor of materials science at Washington State University. Roles held in line management, technology management, research and development, engineering, and manufacturing. Worked in operations, test, and engineering organizations, and led multi-disciplinary project teams of >20 in both manufacturing and engineering research & development. Experienced project manager with historic >\$1M budgetary responsibility per year. Worked with various funding sources including DOD, DARPA, DTRA, DOE, and internal R&D or LDRD. Performed business development, client interaction, proposal writing, presentation, and technology roadmap planning. Worked technology management side with government labs, strategic partners, sponsored university projects, 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. Strength in optical (photonic) and magnetic materials and broadband dielectric and magnetic property characterization. Special interest in solid state chemistry/physics and spectroscopy, particularly of inorganic materials. Materials science focus in ceramics and glasses.

*Current research focusing on the role of structural and chemical disorder in materials and the resulting novel properties.* Produced >90 publications (journal articles, book, conference papers, public reports), >50 public presentations, and 3 issued patents.

## **EDUCATION**

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*Ph.D., Material Science & Engineering, University of Arizona, May 2008*

- Dissertation: "Processing and Properties of Chemical Vapor Deposited Zinc Sulfide"
- 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

*M.S., Materials Science & Engineering, University of Arizona, May 2007*

- 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*

- 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*

- Concentrations: Ceramics, Archaeological Materials

## **EXPERIENCE**

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

*Associate Professor, tenure track*

*School of Mechanical & Materials Engineering (MME), College of Engineering & Architecture*

*Materials Science & Engineering Graduate Program (MSEP)*

*(7/13–present)*

#### • **Teaching**

- MSE 302 “Electronic Materials”
- MSE 403 “Ceramic Materials”
- MSE 503 “Special topics in Materials Science: Glass Science and Technology”
- Various lectures in other courses; more details under “Teaching Experience”

#### • **Scholarship**

- Funded projects
  - nepheline crystallization in nuclear waste glasses (DOE-Office of River Protection)
  - monitoring of degradation in nuclear reactor materials using magnetic measurements & modeling (DOE-Nuclear Energy)
  - technetium local structure in glass (DOE-Office of River Protection; Environmental Molecular Sciences Laboratory funded user proposal)
  - radioactive iodine immobilization (DOE-Nuclear Energy)

#### • **University Service**

- 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
- Admissions committee, MSEP, 2014-15
- Advisor to Materials Advantage student club, 2015-

#### • **Laboratories**

- Glass melting (Dana 349)
- Magnetic materials (ETRL-151)
- X-ray diffraction (ETRL-206)

#### • **Outreach**

- Community outreach: visit elementary school classes to talk about geology/mineralogy, magnetism; 2014 –
- Community outreach: teach STEM subjects in Cub Scouts group; 2013 –

**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, 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**

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- Delegate to National Academy of Engineering, Germany-US Frontiers in Engineering, Potsdam, Germany, 2015.
- Delegate to National Academy of Engineering, US Frontiers in Engineering, Wilmington, DE, 2013.
- Inducted into Order of the Engineer, 2103.
- 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

## **PROFESSIONAL AFFILIATIONS AND SERVICE**

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1. American Ceramic Society (2007 – present)
    - a. Conference chair “Glass and Optical Materials Division” annual meeting for American Ceramic Society, at 11<sup>th</sup> PACRIM, San Diego, CA, 2013
    - b. Conference chair “Glass and Optical Materials Division” at MS&T 2015, Columbus, OH, 2015.
    - c. Member, executive committee: Art, Archaeology, & Conservation Division (2014 – present)
    - d. Member, editorial advisory board: Ceramic Bulletin (2014 – present)
  2. SPIE - Society of Photo-optical Instrumentation Engineers (2004 – present)
    - 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.
  3. Sigma Xi (1996 – present): Scientific Research Society, Full Member
    - a. Chapter Vice-President 2011-2013
  4. Materials Research Society (MRS) (2014 – present)
  5. American Association for the Advancement of Science (AAAS) (2014 – present)
  6. American Society of Engineering Education (ASEE) (2015 – present)
- Other Conference organization
    - Organizing committee member “DOD Electromagnetic Windows” symposium, 2010.
    - Organizing committee member “Waste Forms for Environmental Remediation” for American Chemical Society, Division of Industrial and Engineering Chemistry, 243<sup>rd</sup> ACS national meeting, San Diego, CA, 2012.

## **TEACHING EXPERIENCE**

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*Washington State University (2013 –present)*

- MSE302: Electronic Materials (Fall 2013, Fall 2014) to 100-120 undergraduate engineering students, primarily in Chemical Engineering and Electrical Engineering
- MSE403: Ceramic Materials (Spring 2014) to 30 undergraduate engineering students, primarily in Materials Engineering and Mechanical Engineering
- MSE503: Special Topics: Glass Science & Technology (Spring 2015) to 10 graduate students.
- MSE110: Introduction to Materials Science; guest lecturer – Magnetic materials (Fall 2013); guest lecturer – Glass science (Fall 2014)
- MSE571: Materials Characterization (Spring 2014, Spring 2015); guest lecturer – Electrical and magnetic measurements

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

- Developed and yearly 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.



**PUBLICATIONS: (note authorship is in the order of level of contribution, # indicates WSU student)****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](http://spie.org/x648.html?product_id=2022659).

**JOURNAL ARTICLES (categorized-most recent 1<sup>st</sup> each categ.); publications cited ≥10 times in bold****NUCLEAR WASTE FORMS**

1. John S. McCloy, Nancy Washton, Paul Gassman, Jose Marcial,# Jamie Weaver,# Ravi Kukkadapu, “Nepheline crystallization in boron-rich aluminosilicate glasses as investigated by multi-nuclear NMR, Raman, & Mössbauer spectroscopies,” *Journal of Non-crystalline Solids*, 409, 149-165 (2015). <http://dx.doi.org/10.1016/j.jnoncrysol.2014.11.013>.
2. B.J. Riley, M.J. Schweiger, D.-S. Kim, W.W. Lukens Jr, B.D. Williams, C. Iovin, C.P. Rodriguez, N.R. Overman, M.E. Bowden, D.R. Dixon, J.V. Crum, J.S. McCloy, and A.A. Kruger, “Iodine solubility in a low-activity waste borosilicate glass at 1000 °C,” *Journal of Nuclear Materials*, 452, 178-188 (2014). <http://dx.doi.org/10.1016/j.jnucmat.2014.04.027>.
3. C. Z. Soderquist, M. J. Schweiger, D-S Kim, W. W. Lukens, J. S. McCloy, “Redox-dependent solubility of technetium in low activity waste glass” *Journal of Nuclear Materials*, 449(1-3), 173-180 (2014). <http://dx.doi.org/10.1016/j.jnucmat.2014.03.008>.
4. P. L. Gassman, J. S. McCloy, C. Z. Soderquist, and M. J. Schweiger. “Raman analysis of perhenate and pertechnetate in alkali salts and borosilicate glasses,” *Journal of Raman Spectroscopy*, 45(1), 139-147 (2014). <http://dx.doi.org/10.1002/jrs.4427>.
5. J. Crum, V. Maio, J. McCloy, C. Scott, B. Riley, B. Benefiel, J. Vienna, K. Archibald, C. Rodriguez, V. Rutledge, Z. Zhu, J. Ryan, and M. Olszta, “Cold Crucible Induction Melter Studies for Making Glass Ceramic Waste Forms: A Feasibility Assessment,” *Journal of Nuclear Materials*, 444 (1-3), 481-492 (2014). <http://dx.doi.org/10.1016/j.jnucmat.2013.10.029>
6. J. S. McCloy, B. J. Riley, A. S. Lipton, C. F. Windisch Jr., N. M. Washton, M. J. Olszta, and C. P. Rodriguez, “Structure and Chemistry in Halide-Lead-Tellurite Glasses,” *Journal of Physical Chemistry C*, 117(7), 3456-3466 (2013). <http://dx.doi.org/10.1021/jp310820t>
7. B. Riley, J. S. McCloy, A. Goel, M. Liezers, M. J. Schweiger, J. Liu, C. P. Rodriguez, D. Kim, “Crystallization of rhenium salts in a simulated low-activity waste borosilicate glass.” *Journal of the American Ceramic Society*, 96(4), 1150-1157 (2013). <http://dx.doi.org/10.1111/jace.12280>
8. A. Goel, J. McCloy, C. Windisch, B. Riley, M. Schweiger, C. Rodriguez, J. Ferreira, “Structure of rhenium-containing sodium borosilicate glass,” *International Journal of Applied Glass Science*, 4(1), 42-52 (2013). <http://dx.doi.org/10.1111/ijag.12003>
9. C-W Chung, L Turo, J V Ryan, B R Johnson, J S McCloy, “The effect of concentration on the structure and crystallinity of a cementitious waste form for caustic wastes,” *Journal of Nuclear Materials* 437, 332-340 (2013). <http://dx.doi.org/10.1016/j.jnucmat.2013.02.035>
10. **J.S. McCloy**, B.J. Riley, Goel A, M Liezers, M.J. Schweiger, C.P. Rodriguez, D.S. Kim, P.R. Hrma, W.W. Lukens, and A.A. Kruger, “Rhenium solubility in borosilicate nuclear waste glass: implications for the processing and immobilization of technetium-99,” *Environmental Science & Technology*, 46(22), 12616-12622 (2012). <http://dx.doi.org/10.1021/es302734y>
11. B. Riley, J. Crum, J. Matyas, J. McCloy, W. Lepry. “Solution-derived, chloride-containing minerals as a waste form for alkali chlorides,” *Journal of the American Ceramic Society*, 95(10), 3115-3123 (2012). <http://dx.doi.org/10.1111/j.1551-2916.2012.05363.x>
12. B. Riley, B. Rieck, J. Crum, J. McCloy, S. K. Sundaram, J. Vienna, “Tellurite glass as a waste form for mixed alkali-chloride waste streams: candidate materials selection and initial testing,” *Journal of Nuclear Materials*, 424(1-3), 29-37 (2012). <http://dx.doi.org/10.1016/j.jnucmat.2012.01.024>

13. A. Goel, J. McCloy, K. Fox, C. Leslie, B. Riley, C. Rodriguez, M. Schweiger. "Structural analysis of some sodium and alumina rich high-level nuclear waste glasses," *Journal of Non-crystalline Solids*, 358(3), 674-679 (2012). <http://dx.doi.org/10.1016/j.jnoncrysol.2011.11.015>
14. J. McCloy, M. Schweiger, C. Rodriguez, J. Vienna. "Nepheline Crystallization in Nuclear Waste Glasses: Progress toward acceptance of high-alumina formulations," *International Journal of Applied Glass Science* 2(3):201-214 (2011). <http://dx.doi.org/10.1111/j.2041-1294.2011.00055.x>

### RADIATION EFFECTS ON MATERIALS

15. Maninder Kaur, You Qiang, Carolyn Pearce, John McCloy, "Magnetization measurements and XMCD studies on ion irradiated iron oxide and core-shell iron/iron oxide nanomaterials," *IEEE Transactions on Magnetics*, 50(11), 1-5 (2014). <http://www.dx.doi.org/10.1109/TMAG.2014.2332347>.
16. Weilin Jiang, Jennifer A. Sundararajan, Tamas Varga, Mark E. Bowden, You Qiang, John S. McCloy, Charles H. Henager, Jr., Robert O. Montgomery "In-situ Study of Nanostructure and Electrical Resistance of Nanocluster Films Irradiated with Ion Beams," *Advanced Functional Materials*, 39, 6210-6218 (2014). <http://dx.doi.org/10.1002/adfm.201400553>.
17. Jennifer A. Sundararajan, Maninder Kaur, Weilin Jiang, John S. McCloy, and You Qiang, "Oxide Shell Reduction and Magnetic Property Changes in Core-Shell Fe Nanoclusters under Ion Irradiation," *Journal of Applied Physics*, 115(17), 17B507 (2014). <http://dx.doi.org/10.1063/1.4862520>
18. Shpotyuk, M., O. Shpotyuk, R. Golovchak, J. McCloy, and B. Riley, "Compositional trends of  $\gamma$ -induced optical changes observed in chalcogenide glasses of binary AsS system," *Journal of Non-Crystalline Solids*, 386, 95-99 (2014). <http://dx.doi.org/10.1016/j.jnoncrysol.2013.12.001>
19. John S. McCloy, Weilin Jiang, Timothy C. Droubay, Tamas Varga, Libor Kovarik, Jennifer A. Sundararajan, Maninder Kaur, You Qiang, Edward C. Burks, Kai Liu "Ion irradiation of Fe-Fe oxide core-shell nanocluster films: Effect of interface on stability of magnetic properties," *Journal of Applied Physics*, 114(8), 083903-9 (2013). <http://dx.doi.org/10.1063/1.4818309>
20. S. K. Sundaram, J. McCloy, B. Riley, M. Murphy, A. Qiao, C. Windisch, E. Walter, J. Crum, R. Golovchak, O. Shpotyuk, "Gamma Radiation Effects on Physical, Optical, and Structural Properties of Binary As-S glasses," *Journal of American Ceramic Society*, 95(3), 1048-1055 (2011). <http://dx.doi.org/10.1111/j.1551-2916.2011.04938.x>
21. J. McCloy, R. Kukkadapu, J. Crum, B. Johnson, T. Droubay, "Size Effects on Gamma Radiation Response of Magnetic Properties of Barium Hexaferrite Powders," *Journal of Applied Physics* 110(11), 113912-10 (2011). <http://dx.doi.org/10.1063/1.3665769>
22. P. Lucas, E. King, R. Erdmann, B. Riley, S. Sundaram, J. McCloy, "Thermal and Gamma-ray induced relaxation in As-S glasses: modeling and experiment," *Journal of Physics D* 44(39), 395402 (2011). <http://dx.doi.org/10.1088/0022-3727/44/39/395402>
23. **W. Jiang, J. McCloy, A. S. Lea, J. A. Sundarajan, Q. Yau, Y. Qiang.** "Magnetization and susceptibility of ion irradiated granular magnetite films," *Physical Review B*. 83(13):134435 (2011). <http://dx.doi.org/10.1103/PhysRevB.83.134435>
24. J. A. Sundarajan, D. T. Zhang, Y. Qiang, W. Jiang, J. McCloy, "Helium ion irradiation and magnetic stability of FeO/Fe<sub>3</sub>N nanoparticles." *Journal of Applied Physics*. 109(7), 07E324-3 (2011) <http://dx.doi.org/10.1063/1.3560119>
25. **R. Golovchak, O. Shpotyuk, A. Kozdras, B. Riley, S. K. Sundaram, J. McCloy,** "Radiation effects in physical aging of binary As-(S,Se) glasses." *Journal of Thermal Analysis and Calorimetry*. 103(1):213-218 (2011). <http://dx.doi.org/10.1007/s10973-010-0876-8>

### MAGNETIC MATERIALS AND PROPERTIES

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## PATENTS AND PATENT APPLICATIONS

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#### INVITED PRESENTATIONS (most recent 1<sup>st</sup>)

1. 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.
2. J. McCloy\* "Nanoglasses: Interface and exchange in glass science and magnetism," *Invited* presentation at Materials Science & Technology (MS&T14), Pittsburgh, PA, October 14, 2014.
3. 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.
4. JS McCloy\* "Technetium challenges: Waste forms," *Invited* presentation at the EMSL Radiochemistry Annex Workshop, Richland, WA, July 24, 2014.
5. 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.
6. 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.
7. JS McCloy\* "Spin Disorder in Magnetic Materials," *Invited* speaker at Physics Colloquium, University of Idaho, Moscow, ID, October 14, 2013.
8. 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.
9. 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.
10. 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.
11. 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.
12. 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.
13. 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.
14. 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.
15. 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 1<sup>st</sup>)

16. 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.



17. 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.
18. 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.
19. JS McCloy,\* BJ Riley, CF Windisch, Jr, CP Rodriguez, A Lipton, N Washton, M Olstza, and JD Vienna. 2011. "Role of chloride in TeO<sub>2</sub>-PbO-XCl glass structure." 2012 Glass & Optical Materials Division Spring Meeting, St. Louis, MO, May 2012.
20. JS McCloy,\* A Goel, DS Kim, MJ Schweiger, BJ Riley, PR Hirma, 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.
21. Sundaram SK,\* 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.
22. J. McCloy,\* C. Leslie, W. Jiang, B. Johnson, J. Crum, T. Kaspar, G. Exarhos, T. Droubay. "Glassy magnetic behavior in disordered Ni<sub>2</sub>Co:CuMn<sub>2</sub>O<sub>4</sub> spinels." American Ceramic Society Glass and Optical Materials Division, Savannah, GA, May 2011.
23. 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.
24. 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.
25. 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.
26. 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.
27. John McCloy, Jarrod Crum, S. K. Sundaram, "Millimeter-wave sensor development for coal gasification." Poster presentation at Pittsburgh Coal Conference, Pittsburgh, PA, September 2009.
28. 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.
29. S. K. Sundaram,\* John McCloy, Jarrod Crum. "Sensor Concepts and Development for Coal Gasification." 25<sup>th</sup> International Pittsburgh Coal Conference, Pittsburgh, PA, October 2008.
30. C. Scott Nordahl,\* Todd Gattuso, Tom Hartnett, Rick Gentilman, John McCloy, W. Howard Poisl, and Chuck Willingham, "Characterization of Nanocomposite Optical Ceramics." 32<sup>nd</sup> International Conference on Advanced Ceramics and Composites, Daytona, FL, January 2008
31. 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.
32. John McCloy,\* "Current and Future Technologies for Missile Domes." Advances in Optical Materials (AIOM), Tucson, AZ, October 2005.