

ERICMOORE JOSSOU

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Massachusetts Institute of Technology
Department of Nuclear Science and Engineering
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PROFESSIONAL POSITIONS

Massachusetts Institute of Technology Cambridge, MA
Assistant Professor April 2022 – June 2023

Brookhaven National Laboratory Upton, NY
Assistant Scientist April 2022 – June 2023

Brookhaven National Laboratory Upton, NY
Postdoctoral Research Associate October 2019 – March 2022
Advisors: Lynne Ecker & Simerjeet Gill
The role of anisotropy on the self-organization of gas bubble superlattice

EDUCATION

UNIVERSITY OF SASKATCHEWAN Saskatoon, Canada
PhD, Materials Science (Department of Mechanical Engineering) October 2019
Advisors: Jerzy A. Szpunar & Barbara Szpunar
Dissertation: *Atomic Scale Simulation of Accident Tolerant Fuel Materials for Future Nuclear Reactors*

AFRICAN UNIVERSITY OF SCIENCE AND TECHNOLOGY Abuja, Nigeria
M.Sc., Materials Science and Engineering May 2013
Advisor: Winston Soboyejo
Dissertation: *Numerical Modeling of Wellbore Instability (TENSILE Failure) Using Fracture Mechanics Approach*

AHMADE BELLO UNIVERSITY Zaria, Nigeria
B.Sc., Chemistry January 2011

ACADEMIC HONORS AND AWARDS

Spotlight Award 2020 & 2021
Nuclear Science and Technology Department, Brookhaven National Laboratory

This annual award is given to an employee who demonstrated exceptional efforts in response to the needs of his or her department or division.

Russell (Russ) William Haid Memorial Awards 2019
College of Engineering Graduate Award – Awarded for excellence in academics and research

Lauretta Schoenau Scholarship 2018 & 2019
College of Engineering Graduate Award – Awarded for excellent research in renewable energy

Devolved Scholarship 2018 – 2019
Department of Mechanical Engineering, University of Saskatchewan

George Ira Hanson Postgraduate Award 2018
College of Engineering Graduate Award

International Travel Grant 2017 & 2018

College of Engineering, University of Saskatchewan

International Dean's Scholarship

2015 – 2018

University of Saskatchewan, Canada

This award goes to the most promising international students with stellar academic record and research potential. I was one of three recipients for 2015 admission year in the department of Mechanical Engineering.

World Bank Scholarship

2012 – 2013

African University of Science and Technology, Nigeria

This scholarship is targeted African students for the purpose of bridging the gap in the dearth of scientist on the African continent. I placed top 3 during the selection process which include a written examination and oral interview. 1 of 10 recipients from the entire African continent for the Materials Science and Engineering program. This award covered tuition, accommodation and feeding for my master's degree program.

Best graduating student (departmental)

2011

Department of Chemistry, Ahmadu Bello University

Undergraduate Local Scholar Scheme

2007 – 2010

Petroleum Technology Development Fund, Nigeria

The most competitive undergraduate scholarship award in Nigeria. This award covered tuition, accommodation, and upkeep for my bachelor's degree program. I was one of twelve recipients in Ahmadu Bello University for Chemistry program.

PEER-REVIEW PUBLICATIONS

Adebayo Adelekea, Stanimir Bonev, Christine Wu, **Ericmoore Jossou**, Erin Johnson, A deep Aurum reservoir: Stable compounds of two bulk-immiscible metals under pressure, *Under review, PNAS, 2022*.

Ericmoore Jossou, Ana Suzana, Longlong Wu, Jiecheng Diao, Tadesse Assefa, Ross Harder, Wonsuk Cha, Andrea Jokisaari, Kim Kisslinger, Jian Gan, Ian Robinson, Lynne Ecker, Simerjeet K. Gill; 3D imaging of radiation induced defects in chromium metal using Bragg Coherent Diffraction Imaging, *Under review, npj materials degradation (2022)*.

Ericmoore Jossou, Ana Suzana, Longlong Wu, Jiecheng Diao, Tadesse Assefa, Steven Leake, Adam Gabriel, Anton Schneider, Kim Kisslinger, Lin Shao, Yongfeng Zhang, Lynne Ecker, Jian Gan, Ian Robinson, Simerjeet K. Gill; Radiation induced lattice strains in prototypical palladium metal, *Manuscript in progress, (2022)*.

Ericmoore Jossou, Cheng Sun, Simerjeet K. Gill, Jian Gan, Lynne Ecker; Unravelling the early-stage periodic ordering of Kr gas bubble in Molybdenum, *J. Phys. Chem. C (2021)*, 125, 23338-23348.

Jayangani Ranasinghe, Linu Malakkal, Barbara Szpunar, Anil Prasad, **Ericmoore Jossou**, Jerzy Szpunar, Lukas Bichler; DFT and experimental study on the thermal conductivity of U₃O₈ and U₃O₈-X; (X=Al and Mo), *J. Nucl. Mater. (2021)*, 549, 1-15.

Cheng Sun, Chao Jiang, **Ericmoore Jossou**, Mehmet Topsakal, Simerjeet K. Gill, Yongqiang Wang, Lynne Ecker, Jian Gan; Self-assembly of solid nanoclusters in molybdenum under gas ion implantation, *J. Scripta Materialia (2021)*, 194, 1-5.

Linu Malakkal, **Ericmoore Jossou**, Jayangani Ranasinghe, Barbara Szpunar, Jerzy Szpunar; Density functional theory study of oxygen adsorption and dissociation on lower-miller index surfaces of ThN, *J. Phys. Chem. C* (2020), 124, 45, 24849–24860.

Adebayo Adeleke, **Ericmoore Jossou**, Nnanna Ukoji, Adebayo Adeniyi, Peter Egbele; Properties of alkaline-earth-metal-polynitrogen materials at high pressure crystal, *ACS Omega* (2020), 5, 41, 26786–26794.

Simerjeet K. Gill, Mehmet Topsakal, **Ericmoore Jossou**, Xiaojing Huang, Khalid Hattar, Julia Mausz, Mohamed Elbakhshwan, Hanfei Yan, Yong S. Chu, Cheng Sun, Lingfeng He, Jian Gan, Lynne Ecker; Impact of krypton irradiation on a single crystal tungsten: Multi-modal X-ray imaging study, *Scripta Materialia* (2020), 188, 296-301.

Jayangani Ranasinghe, Linu Malakkal, **Ericmoore Jossou**, Barbara Szpunar, and Jerzy Szpunar; Density functional theory study of the structural, mechanical and thermal conductivity of uranium dialuminide (UAl₂), *J. Nucl. Mater.* (2020), 540, 1-10.

Ericmoore Jossou, Linu Malakkal, Jaya Ranasinghe, Barbara Szpunar, and Jerzy Szpunar; Thermophysical properties (U_xAm_{1-x})O₂ MOX fuel, *J. Comput. Mater. Sci.* (2020), 172, 109324.

Jayangani Ranasinghe, Linu Malakkal, **Ericmoore Jossou**, Barbara Szpunar, and Jerzy Szpunar; Comprehensive study on the electronic and optical properties of α -U₃O₈, *J. Comput. Mater. Sci.* (2020), 171, 109264.

Linu Malakkal, Anil Prasad, Jaya Ranasinghe, **Ericmoore Jossou**, Barbara Szpunar, Lukas Bichler, Jerzy Szpunar, The effect of SPS processing parameters on the microstructure and thermal conductivity of ThO₂, *J. Nucl. Mater.* (2019), 798, 507-516.

Linu Malakkal, Anil Prasad, **Ericmoore Jossou**, Jaya Ranasinghe, Barbara Szpunar, Lukas Bichler, Jerzy Szpunar, Thermal conductivity of bulk and porous ThO₂: Atomistic and experimental study, *J. alloys and compd*, (2019), 798, 507-516.

Ericmoore Jossou, Linu Malakkal, Dzade Nelson, Antoine Claisse, Barbara Szpunar, Jerzy Szpunar; Early oxidation of defective and oxygen covered U₃Si₂ {001}, {110} and {111} surface, *J. Phys. Chem. C* (2019), 123, 32, 19453-19467.

Linu Malakkal, Dotun Oladimeji, Anil Prasad, **Ericmoore Jossou**, Jaya Ranasinghe, Barbara Szpunar, Lukas Bichler, Jerzy Szpunar; Thermal Conductivity and Mean Free Path of CeO₂, *Sci. Rep.* 9 (2019) 6326.

Ericmoore Jossou, Md. Jahidur Rahman, Dotun Oladimeji, Benjamin Beeler, Barbara Szpunar, Jerzy Szpunar; Anisotropic thermophysical properties of U₃Si₂ fuel: An atomic scale study, *J. Nucl. Mater.*, (2019), 512, 1-12.

Jaya Ranasinghe, Barbara Szpunar, **Ericmoore Jossou**, Linu Malakkal, Jerzy Szpunar; Study on radial temperature distribution of aluminum dispersed nuclear fuels: U₃O₈-Al, U₃Si₂-Al, and UN-Al; *Nucl. Eng. & Rad. Sci.*, (2018), Vol. 4 / 031020-1.

Ericmoore Jossou, Ubong Eduok, Dzade Nelson, Barbara Szpunar, Jerzy Szpunar; Oxidation behaviour of U₃Si₂: An experimental and first principles investigation, *Phys. Chem. Chem. Phys.*, (2018), 20, 4708-4720.

Adebayo A. Adeleke, **Ericmoore Jossou**, Yansun Yao; Stable BaCl solid at high pressure: Prediction and characterization using first principles approach, *J. App. Phys.*, (2017), 122, 235902.

Oladimeji Dotun, Malakkal Linu, Barbara Szpunar, **Ericmoore Jossou**, Jerzy Szpunar; First principles study of thermal transport properties of gallium phosphide, *Int. J. of Metall. & Met. Phys.*, (2017) 2:006.

Ericmoore Jossou, Dotun Oladimeji, Linu Malakkal, Simon Middleburgh, Barbara Szpunar, Jerzy Szpunar; First-principle study of defects and fission product behaviour in uranium diboride” *J. Nucl. Mater.*, (2017), 494, 147-156.

Ubong Eduok, **Ericmoore Jossou**, Jerzy Szpunar; Enhancing surface protective performance of chitosanic hydrogel by nano-CeO₂ dispersion for API 5L X70 alloy: Experimental and theoretical examination of the contributions of CeO₂, *J. Mol. Liq.* 241 (2017) 684–693.

Ericmoore Jossou, Linu Malakkal, Barbara Szpunar, Dotun Oladimeji, Jerzy Szpunar; A first principles study of the electronic structure, elastic, and thermal properties of UB₂, *J. Nucl. Mater.*, (2017), 490, 41-48.

Ubong Eduok, **Ericmoore Jossou**, Ahmed Tiamiyu, Joseph Omale, Jerzy Szpunar; Ceria/Acrylic Polymer Microgel Composite: Synthesis, Characterization, and Anticorrosion Application for API 5L X70 Substrate in Chloride-Enriched Medium, *Ind. Eng. Chem. Res.*, 2017, 56 (19), pp 5586–5597.

Barbara Szpunar, Linu Malakkal, **Ericmoore Jossou**, Jerzy Szpunar; First principles investigation of alternative nuclear fuels: a chapter in Energy Materials edited by Xingbo Liu *et al.*, p. 367 – 376 (Springer Press, 2017).

REPORTS SUBMITTED TO GRANT AGENCIES

Mehmet Topsakal, **Ericmoore Jossou**, *et al.*, “Status Report on the X-ray Diffraction Computed Tomography Endstation at the NSLS-II X-Ray Powder Diffraction Beamline for Nuclear Materials Characterization” Brookhaven National Laboratory, M3UF-20BN0204042, March 2020.

Mehmet Topsakal, Simerjeet Gill, **Ericmoore Jossou**, *et al.*, “Report on the Status of the X-ray Fluorescence Tomography Capability for Radioactive Material Characterization at the X-Ray Powder Diffraction Beamline,” Brookhaven National Laboratory, M3UF-19BN0204044, September 2020.

INVITED TALKS, CONFERENCE PRESENTATIONS AND WORKSHOPS

Ericmoore Jossou; Rational materials design for nuclear energy applications, **Invited talk** at Schwarzman College of Computing, Massachusetts Institute of Technology – November 1, 2022, Cambridge, Massachusetts, United States.

Ericmoore Jossou, Cheng Sun, Simerjeet K. Gill, Jian Gan, Lynne Ecker; Unravelling the early-stage periodic ordering of Kr gas bubble in Molybdenum, TMS, February 27 – March 3, 2022, Anaheim, California, United States.

Ericmoore Jossou, Cheng Sun, Simerjeet K. Gill, Jian Gan, Lynne Ecker; Unravelling the early-stage periodic ordering of Kr gas bubble in Molybdenum, MRS, May 8-13, 2022, Honolulu, Hawai’i, United States.

Ericmoore Jossou; Materials design for nuclear applications, **Invited talk** at Nuclear Science and Engineering Department, Massachusetts Institute of Technology – April 25 – 26, 2022, Cambridge, Massachusetts, United States.

Ericmoore Jossou, Mehmet Topsakal, Xiaojing Huang, Khalid Hattar, Julia Mausz, Mohamed Elbakhshwan, Hanfei Yan, Yong S. Chu, Cheng Sun, Lingfeng He, Jian Gan, Lynne Ecker, Simerjeet K.

Gill; X-ray based nanodiffraction to study strain in materials for nuclear energy, TMS, March 15 – 18 2021, Virtual.

Ericmoore Jossou; Rational materials design for energy applications, **Invited talk** at the Research series of the Nuclear Science and Technology Department, BNL, October 2020.

Ericmoore Jossou, Md. Jahidur Rahman, Benjamin Beeler, Barbara Szpunar, and Jerzy Szpunar; Anisotropic thermophysical properties of U_3Si_2 fuel: An atomic scale study, Canadian Nuclear Society, 9th International Conference on Simulation Methods in Nuclear Science and Engineering October 2019, Saskatoon, Saskatchewan, Canada.

Ericmoore Jossou, Nelson Dzade, Barbara Szpunar, and Jerzy Szpunar; Oxidation behaviour of U_3Si_2 : An Ab Initio Study, Canadian Nuclear Society, 8th International Conference on Simulation Methods in Nuclear Science and Engineering October 2018, Ottawa, Ontario, Canada.

Ericmoore Jossou, Linu Malakkal, Dotun Oladimeji, Barbara Szpunar, Jerzy Szpunar; Stability of noble gases in uranium diboride: An atomic-scale study, Nuclear Materials Conference February – October 2018, Seattle, Washington, United States.

MICCOM Computational Summer School, The University of Chicago, Chicago, IL, July 2017

Ericmoore Jossou, Linu Malakkal, Dotun Oladimeji, Barbara Szpunar, Jerzy Szpunar; First Principles Study of Accident Tolerant Nuclear Fuel: UB_2 and UO_2 , TMS February – March 2017, San Diego, California, United States.

Ericmoore Jossou, Linu Malakkal, Jaya Ranasinghe, Barbara Szpunar, and Jerzy Szpunar; Ab-initio study on U_3O_8 , WIEN2K workshop July 2016, Hamilton, Canada.

MENTORING AND ADVISING

Research mentor 2017 – 2021
Trained three PhD students in Molecular Dynamic simulations and how to model materials surfaces using DFT and Python based scripting. This effort led to the co-authorship of 4 journal papers in materials modelling. I also trained students in the use of the dilatometry, Differential Scanning Calorimetry and Raman Spectroscopy.

Science Undergraduate Laboratory Internships		2021 – 2023
Collen Campbell	Massachusetts Institute of Tech	June 2021 – Aug 2021
Nicolo Zucchi	Tufts University	Jan 2022 – April 2022
Rosemary Cortes Robles	University of Puerto Rico	Jan 2022 – April 2022
Alexa Zaback	Oregon State University	June 2022 – Aug 2022
Kemal Atay	Boston College	Oct 2022 – Dec 2022
Riley Hultquist	Georgia Tech	Oct 2022 – Till date
Tyler Brook	St. Joseph University	Jan 2023 – April 2023

TEACHING EXPERIENCE

Graduate Teaching assistant, University of Saskatchewan (U of S) Saskatoon, Canada
Course: Engineering Mechanics I Fall term 2018

- Taught the weekly tutorial class: I went over problems that is aimed to assist students with the materials that were covered in lectures, and I also developed notes that introduced them to the mathematical tools for solving engineering problems.
- Graded final examination scripts.
- Invigilated examinations.

Adjunct Lecturer, College of Education (Technical)

Lagos, Nigeria

Course: Calculus I & II

2013 – 2014

- Taught weekly classes from course notes that I developed
- Held office hours and answered questions from students
- Examination Invigilator.
- Graded final examination scripts.

Science tutor, Communities Without Boundaries International

Abuja, Nigeria

Subject: Physics and Chemistry

2012 – 2013

- Taught weekly Chemistry and Physics classes in public high schools where there is shortage of science teachers. The schools are located in “hard to reach communities” due to the lack of motorable roads to the communities. The project was coordinated by Communities Without Boundaries International in conjunction with African University of Science and Technology.

COMMUNITY SERVICE AND LEADERSHIP

ANS Young Members Group

Virtual

Panelist: YMG Spotlight on National Labs series shines on Brookhaven

March 2021

Brookhaven National Laboratory

Upton, NY

Postdoctoral search committee member: Noble Gas Trapping project

2020

University of Saskatchewan

Saskatoon, Canada

Steering and Constitution drafting committee member: Nigerian Student Association 2017 – 2018

African University of Science and Technology

Abuja, Nigeria

Board Member (Fundraising committee): African Materials Research Society

2012 – 2013

Ahmadu Bello University

Zaria, Nigeria

Electoral Committee Chair: Student Chemical Society of Nigeria

2010

Journal Reviewer

2017 – Till date

Review for over 15 journals in Materials Science and Engineering, Nuclear Materials and Applied Physics that includes Journal of Nuclear Materials, Journal of Applied Physics, Materials Research, Journal of Physics and Chemistry of Solids, Materials Science and Engineering A & B, Journal of Materials Engineering and Performance, International journal of heat transfer, ACS Omega etc.

Grant Reviewer

2023 – Till date

DOE Office of Science Graduate Student Research program

GRANTS AND PROPOSAL AWARDS

1. Several successful synchrotron beamtime and equipment time award at Advanced Photon Source, National Synchrotron Light Source II, European Synchrotron Radiation Facility and Center for Functional Nanomaterials
2. Grant: Simerjeet K. Gill (Principal), Ericmoore Jossou (co-Principal), Mehmet Topsakal (co-Principal), David Brown (co-Principal), and Matthew Wellons co-Principal: Savanah River National Laboratory), Spencer Scott (co-Principal: Savanah River National Laboratory), “Expanding the nuclear forensic toolkit: high-throughput synchrotron-based studies of actinide-containing reference particulates” Sponsored by National Nuclear Security Administration, Federal, Total: \$3,000,000 October 1, 2022 - September 30, 2025; Percent Contribution: 20%
3. Program development Grant: Ericmoore Jossou (Principal), Simerjeet K. Gill (co-Principal), Spencer Scott (co-Principal: University of Calgary) “Machine-Learning assisted high

throughput design of high entropy alloy for nuclear energy applications” Sponsored by Brookhaven National Laboratory, Total: \$75,000 October 1, 2022 - September 30, 2023; Percent Contribution: 100%

PROFESSIONAL MEMBERSHIPS

Member, American Nuclear Society (ANS)	2022 – Till date
Member, Materials Research Society (MRS)	2019 – Till date
Member, The Minerals, Metals and Materials Society (TMS)	2017 – Till date
Member, American Society for Metal (ASM)	2017 – Till date