Miu Lun (Andy) Lau

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Education

Boise State University **Expected May 2023**

Ph.D student in Computational Science and Engineering

Boise State University **May 2018**

Bachelor of Science in Mechanical Engineering
GPA: 3.7/4.0

Research Interests

Fluid and heat mass simulation; Nuclear Fuel Modelling; Microstructure evolution

Research Experience

Scientific Computing Group **Boise, ID**
Graduate Researcher Sep 2017 - Present
Advisor: Min Long

- Develop multi-components Phase-Field solidification models of stainless steel
- Simulate in-pile nuclear fuels and advanced instrumentation using Extended FEM
- Develop machine learning algorithms for analyzing Extended X-ray Absorption Fine Structure Spectra
- Analysis and modeling of oxide growth of Zirconium alloy
- Develop mesoscale simulation of grain evolution and structure deformation of stainless steel
- Develop crystal structure graphical interfaces to facilitate students driven learning

Electrochemical Energy Material Laboratory **Boise, ID**
Undergraduate Research Assistant Aug 2015 - May 2018
Advisor: Hui Xiong

- Collaborated with professors and research teams on battery optimization
- Evaluated capacity and cyclability of bulk/nano-materials in electrical systems

Idaho National Laboratory **Boise, ID**
Undergraduate Research Internship May 2017 - Aug 2017
Advisor: Yidong Xia, Robert Rodgorney

- Developed algorithms to generate Tetrahedral mesh from point clouds
- Provided data validation tools for computational fluid dynamics

Conferences and Presentations

- **M. Lau**, J. Terry, M Long "Extended X-Ray Adsorptions Fine Spectrum Fitting using Genetic Algorithms", SIAM CSE21, Fort Worth, March 2021
- J. Klse, **M. Lau**, C. Sun, B. Hendricks, C. Xu et al. "Analyzing Extended X-Ray Absorption Fine Structure Spectra with Machine Learning Algorithm" LDRD Review, Idaho Fall, Oct 2019
- **M. Lau**, M. Long et al. "XFEM fracture modeling of fuel with moment fitting approaches and gap conductance" NuMAT18, Seattle, Oct 2018

- **M. Lau**, M. Long et al. "Phase-Field Modelling of Nanoparticle Sintering for Cu-Ni Alloy Printing" CAES Materials Science Roadmap and Capabilities Meeting, Boise, Aug 2018
- C. Deng, **M. Lau** et al. "Amorphous Nanorod Boron As Anode Material for Lithium Ion Batteries at Room Temperature." ECS 232nd, National Harbor, Oct 2017
- **M. Lau**, C. Deng et al. "Three-Dimensional Scaffolded Cu-Sn Anode for Lithium-Ion batteries", BSU URC, Boise, Apr 2016

Teaching Experience

Teaching Assistant, Introduction to Computational Mathematics (MATH365) Fall 2018

Michal Kopera, *Department of Mathematics*, *Boise State University*

- Evaluate and grade course assignments
- Held weekly lab and study sessions

Project organizer, Computing Foundation for Computational Sciences (CS507) Fall 2017

Min Long, *College of Engineering*, *Boise State University*

- Prepared final project for students

Teaching Assistant, Introduction to Computation for Engineers (ME271) Spring 2017

Min Long, *College of Engineering*, *Boise State University*

- Evaluate and grade course assignments
- Organize and proctor exams according to regulations

Computational Experiences

- High Performance Computing(HPC) experience: FALCON, Lemhi, Sawtooth
- Programming Language: C++, Python, CUDA, MATLAB, C
- Software: MOOSE, Paraview, SolidWork, PhotoView360, Cubit, Origin Pro, VESTA

Honors & Awards

Dean's Honor List	2014 - 2018
Idaho Opportunity Scholarship	2014 - 2017
Drive of Education Scholarship	2014
Dr. Bob Haley Memorial Scholarship	2014
National Honors Society	2014

Certifications & Affiliations

Certified Solidworks Associate

PC-Pro Certification 220-801 & 220-802

Network Pro Certification

OSHA General Industry Certification

American Institute of Aeronautics and Astronautics(AIAA)

American Society of Mechanical Engineerings(ASME)

Publications

[1] Terry, J., **Lau, M.** , Sun, J., Xu, C., Hendricks, B., Kise, J., Lnu, M., Bagade, S., Shah, S., Makhijani, P., Karantha, A., Boltz, T., Oellien, M., Adas, M., Argamon, S., Long, M., Guillen. D.P., Analysis of Extended X-ray Absorption Fine Structure (EXAFS) Data Using Artificial Intelligence Techniques, Applied Surface Science 547, 149059 https://doi.org/10.1016/j.apsusc.2021.149059 (2021).
[2] Goncharov, V. G., Wei, N., **Lau, M.**, Ennaceur, S. M., Migliori, A., Xu, H., Long, M., Guo X., Thermodynamic and elastic properties of cerium doped yttrium aluminum garnets, Journal of the American Ceramic Society, 2021, 00:119.
[3] Cockreham, C., Zhang, X., **Lau, M.**, Long, M., Guo, X., Xu, H., Wu, D., Thermal Evolution and Resulted Microstructural Changes in Kerogen-Rich Marcellus Shale, Journal: ACS Earth and Space Chemistry, 2020, 4, 12, 24612469.
[4] C. Deng, C. Ma, **M. Lau**, P. Skinner, Y. Liu, W. Xu, H. Zhou, Y. Ren, Y. Yin, B. Williford, M. Dahl, H. Xiong "Amorphous and Crystalline TiO2 Nanoparticle Negative Electrodes for Sodium-ion Batteries" Electrochimica Acta 321 (2019): 134723

[5] C. Deng, **M. Lau**, C. Ma, P. Skinner, Y. Liu, W. Xu, H. Zhou, Y. Ren, Y. Yin, B. Williford, M. Dahl, H. Xiong "The Importance of Crystallinity to the Electrochemical Properties of Nanoscale Negative Electrode Materials for Lithium Ion Batteries: the Case of Titania" Electrochimica Acta[`Under Review`]

[6] C.Deng, **M. Lau**, C. Ma, P. Skinner, Y. Liu et al, "Effect of Crystallinity of TiO2 Nanoparticles as Anode Material for Lithium-Ion Batteries, Chemistry of Materials [`Submitted`]

[7] C.Deng, P. Skinner, Y. Liu, R. Hunt, **M. Lau**, M. Sun, et al, "Li-Substituted Layered-Spinel Cathode Material for Sodium-Ion Batteries" Chemistry of Materials 30.22 (2018): 8145-8154

[8] C. Deng, **M. Lau.**, H. Barkholtz, H. Xu, R. Parrish, et al. "Amorphous Boron Nanorod as An Anode Material for Lithium-ion Batteries at Room Temperature." Nanoscale 9.30 (2017): 10757-10763.

References

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Assistant Professor
Micron School of Materials, Boise State University
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Dr. Jeff Terry
Professor of Physics
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