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] **Lau, M.** , Long M., Terry J., "Automated Materials Spectroscopy Analysis using Genetic Algorithms", Springer Nature, (2021)

[2] 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).

[3] 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.

[4] 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.

[5] 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

[6] 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

[7] 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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Professor of Physics
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