

# Qingqing Liu, PhD

Starkville, MS 39759

## EDUCATION

<b>University of Michigan-Ann Arbor</b>	2020
PhD and MSE in Nuclear Engineering and Radiological Sciences	
<b>Shanghai Jiao Tong University</b>	2015
MS in Mechanical Engineering	
<b>University of Shanghai for Science and Technology</b>	2012
BS in Mechanical Engineering	

## RESEARCH INTERESTS

- ❖ Two-phase flow and heat transfer
- ❖ Boiling and cavitation
- ❖ Reactor thermal hydraulics
- ❖ Cryogenic fluids
- ❖ Advanced instrumentation development

## PROFESSIONAL EXPERIENCE

Assistant Professor	Mississippi State University	08/2024-present
Research Scientist	DYNAFLOW, INC.	09/2021-07/2024
Postdoctoral Research Fellow	University of Michigan-Ann Arbor	10/2020-09/2021
Graduate Student Research Assistant	University of Michigan-Ann Arbor	01/2017-08/2020
Graduate Research Associate	The Ohio State University	05/2015-12/2016
Graduate Research Assistant	Shanghai Jiao Tong University	09/2012-03/2015

## PROFESSIONAL SERVICE

**Reviewer for Journals:** Applied Energy, Experimental Thermal and Fluid Science, Applied Thermal Engineering, Nuclear Engineering and Design, Nuclear Engineering and Technology, Energy Conversion and Management, and Energy Conversion and Management: X

**Reviewer for Conferences:** 2021 ANS Annual Meeting, NURETH-19, and ATH 2022

**Memberships:** American Nuclear Society (ANS), American Society of Mechanical Engineers (ASME), and American Society for Gravitational and Space Research (ASGSR)

## SELECTED HONORS

Outstanding reviewer award for Nuclear Engineering and Technology	2022
Best paper award in NURETH-19	2022

Rackham Graduate Student Research Grant	2019
Outstanding Graduates of Shanghai Jiao Tong University	2015
Outstanding Graduates of Shanghai	2012
Outstanding Graduates of University of Shanghai for Science and Technology	2012

## **SKILLS**

- ❖ Software: OpenFOAM, STAR CCM+, ANSYS FLUENT, COMSOL Multiphysics, MATLAB, LabVIEW, SolidWorks, AutoCAD, ParaView, Python, VB.NET, etc.
- ❖ Experimental skills: Design, construction, and testing of test facility; application of traditional and advanced measurement instruments in heat transfer and fluid dynamics experiments.

## **JOURNAL ARTICLES**

- [1] Chahine, G.L., Schmidt, B., Deng X., Hsiao C-T., and **Liu, Q.**, “Bubble Dynamics in a Pressure Gradient with Reentrant Jet Break Through and Energy Loss”. *Ultrasonics Sonochemistry*, 2023, 99, 106541.
- [2] **Liu, Q.**, Liu, Y., Burak, A, Kelly, J., Bajorek, S., and Sun, X., “Tree-based Ensemble Learning Models for Wall Temperature Predictions in Post-CHF Flow Regimes at Subcooled and Low-Quality Conditions”, *ASME Journal of Heat and Mass Transfer*, 2023, 145(4): 041604.
- [3] Diaz, J., **Liu, Q.**, Petrov, P., Manera, A., and Sun. X., “High-Resolution X-ray Radiography Methods Developed for Post-CHF Experiment”, *Nuclear Technology*, 2023, 1-24.
- [4] **Liu, Q.**, Diaz, J., Petrov, P., Burak, A., Manera, A., Kelly, J., and Sun. X., “Void Fraction Measurement and Prediction of Two-phase Boiling Flows in a Tubular Test Section”, *ASME Journal of Nuclear Engineering and Radiation Science*, 2023, 9(2), 021403.
- [5] **Liu, Q.**, Kelly, J., and Sun, X., “Study on the Interfacial Friction in the Inverted Annular Film Boiling Regime”, *Nuclear Engineering and Design*, 2021, 375, 111082.
- [6] **Liu, Q.**, Kelly, J., and Sun, X., “Flow Regime Transition in the Post-CHF Flow Regimes under Subcooled and Low-quality Conditions”, *International Journal of Multiphase Flow*, 2021, 136, 103543.
- [7] **Liu, Q.**, Sun, H., Liu, Y., Sun, X., and Kelly, J., “Experimental Study of Post-CHF Heat Transfer in a Vertical Tubular Test Section”, *International Journal of Heat and Mass Transfer*, 2021, 166, 120697.
- [8] **Liu, Q.** and Sun, X., “Wall Heat Transfer in the Inverted Annular Film Boiling Regime”, *Nuclear Engineering and Design*, 2020, 363, 110660.
- [9] **Liu, Q.**, Shi, S., Sun, X., and Kelly, J., “Thermal Hydraulic Performance Analysis of a Post-CHF Heat Transfer Test Facility”, *Nuclear Engineering and Design*, 2018, 339: 53-64.

- [10] Han, X., **Liu, Q.**, and Jiang, X., “Heat Transfer Characteristics of Oil Shale Particle during the Retorting”, *International Journal of Heat and Mass Transfer*, 2015, 84: 578–583.
- [11] **Liu, Q.**, Han, X., Li, Q., Huang, Y., and Jiang, X., “TG–DSC Analysis of Pyrolysis Process of Two Chinese Oil Shales”, *Journal of Thermal Analysis and Calorimetry*, 2014, 116 (1): 511-517.
- [12] Li, Q., Han, X., **Liu, Q.**, and Jiang, X., “Thermal Decomposition of Huadian Oil Shale. Part 1. Critical Organic Intermediates”, *Fuel*, 2014, 121:109-116.

### **CONFERENCE PROCEEDINGS**

- [1] **Liu, Q.**, Liu, Y., Sun, X., Wang, D., Liu, Y., Buchananc, J., and Worosz, T., “Experimental Study and CFD Simulation of Air-Water Bubbly Flow in a Rectangular Channel”, 20th International Meeting on Nuclear Reactor Thermal Hydraulics (NURETH 20), August 20–25, 2023, Washington, D.C., United States.
- [2] Wang, D., Fu, Y., Sun, H., Liu, Y., **Liu, Q.**, Liu, Y., Sun, X., Buchananc, J., and Worosz, T., “A Comprehensive Measurement of Bubbly Flow in a 30 mm × 10 mm Rectangular Channel”, 20th International Meeting on Nuclear Reactor Thermal Hydraulics (NURETH 20), August 20–25, 2023, Washington, D.C., United States.
- [3] **Liu, Q.**, Burak, A., Kelly, J., and Sun, X., “Experimental Investigation of Flow Instabilities in Subcooled Flow Boiling”, 2022 Japan-U.S. Seminar on Two-Phase Flow Dynamics, May 8-11, 2022, Virtual Meeting.
- [4] **Liu, Q.**, Diaz, J., Petrov, P., Burak, A., Manera, A., Kelly, J., and Sun. X., “Experimental Investigation and CFD Modeling of Reflooding Phenomena in a Tubular Test Section”, 19th International Meeting on Nuclear Reactor Thermal Hydraulics (NURETH 19), March 6 - 11, 2022, Virtual Conference, online.
- [5] Diaz, J., **Liu, Q.**, Petrov, P., Manera, A., and Sun. X., “High-Resolution X-ray Radiography Methods Developed for Post-CHF Experiment”, 19th International Meeting on Nuclear Reactor Thermal Hydraulics (NURETH 19), March 6 - 11, 2022, Virtual Conference, online.
- [6] **Liu, Q.**, Diaz, J., Petrov, P., Burak, A., Manera, A., Kelly, J., and Sun. X., “Void Fraction Measurement and Prediction of Two-phase Boiling Flows in a Tubular Test Section”, 28th International Conference on Nuclear Engineering (ICONE 28), August 4-6, 2021, online.
- [7] **Liu, Q.**, Shi, S., Wang, L., Sun, X., and Kelly, J., “Thermal Analysis of a Test Facility for Post-CHF Heat Transfer Experiments”, 2017 Japan-U.S. Seminar on Two-Phase Flow Dynamics, June 22-24, 2017, Sapporo, Hokkaido, Japan.
- [8] **Liu, Q.**, Lv, Q., Shi, S., Sun, X., and Kelly, J., “Design of Post-CHF Heat Transfer Experiments for High-Pressure and High-Flow Conditions”, 2016 International Congress on Advances in Nuclear Power Plants (ICAPP 2016), San Francisco, CA, April 17 – 20, 2016, pp. 2229-2245.

## **PRESENTATIONS**

- [1] Chahine, G., **Liu, Q.**, and Hsiao, C., “Experimental and Numerical Study of Pressure Drop Characteristics of DYNASWIRL<sup>®</sup> Phase Separators for Various Fluids”, 39<sup>th</sup> American Society for Gravitational and Space Research Annual Meeting (ASGSR 2023), Washington, D.C., November 14 - 18, 2023.
- [2] Chahine, G., **Liu, Q.**, and Hsiao, C., “DYNASWIRL<sup>®</sup> Phase Separator for Cryogenic Liquid/Vapor Separation in Microgravity”, 2022 American Institute of Aeronautics and Astronautics Young Professionals, Students, and Educators Conference (AIAA YPSE 2022), Laurel, MD, November 18 - 19, 2022.
- [3] Chahine, G., **Liu, Q.**, and Hsiao, C., “Design and Testing of a DYNASWIRL<sup>®</sup> Phase Separator in a Cryogenic Transfer Loop”, 38<sup>th</sup> American Society for Gravitational and Space Research Annual Meeting (ASGSR 2022), Houston, TX, November 9 - 12, 2022.
- [4] **Liu, Q.**, Burak, A., Kelly, J., and Sun, X., “Experimental Investigation of Flow Instabilities in Subcooled Flow Boiling”, 2022 Japan-U.S. Seminar on Two-Phase Flow Dynamics, May 8-11, 2022, Virtual Meeting.
- [5] **Liu, Q.**, Diaz, J., Petrov, P., Burak, A., Manera, A., Kelly, J., and Sun, X., “Void Fraction Measurement and Prediction of Two-phase Boiling Flows in a Tubular Test Section”, 28th International Conference on Nuclear Engineering (ICONE 28), August 4-6, 2021, Virtual Conference, online.
- [6] **Liu, Q.**, Lv, Q., Shi, S., Sun, X., and Kelly, J., “Design of Post-CHF Heat Transfer Experiments for High-Pressure and High-Flow Conditions”, 2016 International Congress on Advances in Nuclear Power Plants (ICAPP 2016), San Francisco, CA, April 17 – 20, 2016.

## **PATENTS**

- [1] Han, X., Jiang, X., **Liu, Q.**, Li, Q., et al., A pressure hydrogenation system and process of oil shale retorting. National invention patent. Patent No.: CN 103911169 A.
- [2] Han, X., Jiang, X., Li, Q., **Liu, Q.**, et al., A system and process of comprehensive utilization of oil shale pyrolysis and char gasification. National invention patent. Patent No.: CN 103923677 A.