

# Position Description

Date: September 2026

Title: Postdoctoral Scholar

Department: Mechanical and Aerospace Engineering

School: Case School of Engineering

Location: 10900 Euclid Ave, Cleveland, OH 44106

Supervisor Name and Title: Chirag Kharangate, Associate Professor

Contact information: Email: [chirag.kharangate@case.edu](mailto:chirag.kharangate@case.edu); Phone: 216-368-2029

## POSITION OBJECTIVE

Postdoctoral position in the Two-Phase Flow and Thermal Management Lab at Case Western Reserve University to do research in two-phase flows with focus on machine learning application to phase-change thermal management systems, including autonomous vision and Physics-informed neural networks (PINNs).

## GENERAL DESCRIPTION

The Two-Phase Flow and Thermal Management lab at CWRU is looking for a highly qualified postdoctoral researcher to develop advanced machine learning algorithms for computer vision, flow imaging, flow reconstruction, and parameter estimation specific to boiling and condensing systems. The ideal candidate will have advanced experience in widely utilized machine learning platforms, preferably Jax, PyTorch, and/or TensorFlow.

The ideal candidate should be able to develop advanced machine learning architectures and have an extensive knowledge of the body of available machine learning methods relevant to scientific applications. This would include: Deep Neural Networks, Convolutional Neural Networks, UNets, Neural Operators, Transformers, and Physics Informed Neural Networks. The ideal candidate would also be able to keep up with the relevant literature on SciML methods including non-network based optimization and learning methodologies.

Secondary responsibilities will include designing experiments and collecting data for ML methods. Using ANSYS Fluent and traditional numerical codes for validation and data generation. Position requires a basic understanding of traditional finite volume, finite element, and finite difference methods in order to be compared to machine learning methods.

## ESSENTIAL FUNCTIONS

1. Develop physics-informed machine learning modeling tools and validate with experiments performed in the lab (40%)
2. Perform experiments in two-phase flows for boiling and condensation (15%)
3. Perform CFD simulations in two-phase flows for boiling and condensation (15%)
4. Publish peer-reviewed journal papers and attend international conferences to disseminate and share research (20%)

Job Title

5. Coordinate with sponsors for meeting research project deliverables (10%)
6. Advise graduate and undergraduate students at the Two-Phase Flow and Thermal Management Lab in conducting their research projects relating to boiling and condensation experiments and modeling (10%)

#### NONESSENTIAL FUNCTIONS

Attend department and school education and outreach activities

#### CONTACTS

Department: continuous (66+%)

University: infrequent (up to 5%)

External: moderate (16-30%)

Students: moderate (16-30%)

#### SUPERVISORY RESPONSIBILITY

None

#### QUALIFICATIONS

Experience: 0+

Education/Licensing: PhD in Engineering

#### REQUIRED SKILLS

1. Machine Learning/ Neural Networks
2. ANSYS Fluent/COMSOL multiphasic Solver
3. Experimental design and thermal-fluidic testing experience in lab setting
4. Parallel computing for machine learning methods
5. Jax and/or Pytorch for large models >100,000 parameters.
6. Inverse problem design and numerical optimization.
7. Experience with Linux terminals and HPC.

#### WORKING CONDITIONS

No special working conditions.

#### APPLICATION INSTRUCTIONS

If you are interested in this position, please email your cover letter and CV to Chirag Kharangate at [crk91@case.edu](mailto:crk91@case.edu).