

JIN, Hong-Qing

Mechanical Engineering Laboratory 3420, University of Illinois at Urbana Champaign
105 S Mathews Ave, Urbana, Illinois 61801, United States of America
Phone: 1-217-819-2980 • Email: hj8@illinois.edu

EDUCATION

- Ph.D.** Mechanical Engineering May 2022 (expected)
University of Illinois at Urbana Champaign (UIUC), Urbana, Illinois, USA
Thesis: Crystallization fouling and liquid retention on engineered surfaces during liquid-vapor phase change heat transfer (tentative)
Advisor: Sophie WANG
- M.S.** Engineering Thermophysics Jun 2017
Zhejiang University (ZJU), Hangzhou, Zhejiang, China
Thesis: Study of the local thermal non-equilibrium effect at the pore-scale during the melting in an open-celled metal foam saturated with a phase change material (PCM) using infrared imaging method
Advisor: Prof. Zi-Tao YU, *Co-Advisors:* Prof. Li-Wu FAN
- B.E.** Energy and Environmental Systems Engineering Jun 2014
Zhejiang University, Hangzhou, Zhejiang, China

RESEARCH EXPERIENCE

- Graduate Research Assistant**, *Department of Mechanical Science and Engineering, UIUC* Sep 2017–present
Participating in two (2) projects funded by the Air Conditioning and Refrigeration Center (ACRC), the ZJU-UIUC Research Institute and the Department of Energy (DOE) Office of Energy Efficiency and Renewable Energy to work on:
- Drainage of condensate retention between fins using wettability management** Sep 2017–Jun 2019
- Using wettability management method to drain the refrigerant retained on finned tubes. With partially hydrophilic coating or superhydrophobic coating, various gradients being explored to improve the heat transfer performance.
 - Visualization study of liquid retention behavior via high speed imaging and analysis program.
- Study of anti-fouling methods for heat exchanger during solar desalination** Sep 2018–present
- Simulation of heat and mass transfer for in-tube condensation and falling film evaporation during thermal desalination process.
 - Batch numerical simulations and machine learning to correlate desalination performance to operating conditions, and multi-objective optimization for desalination conditions.
 - Surface induced crystallization fouling by calcium carbonate on different surface material and engineered structures in stirring tank reactor.
 - Experimental study of heat and mass transfer on falling film evaporator focusing on scale formation, surface modification, and liquid retention behavior.
- Graduate Teaching Assistant**, *Department of Mechanical Science and Engineering, UIUC* Jan 2020–present
- Convective heat transfer at Graduate level
 - Multiphase systems & processes at Graduate level
 - Energy conversion system
- Graduate Research Assistant**, *Institute of Thermal Science and Power Systems, Zhejiang University* Mar 2014–Jun 2017
Participating in three (3) projects funded by the *National Natural Science Foundation of China (NSFC)* to work on:
- A visualized study of melting in copper foam/paraffin via infrared (IR) imaging** Jun 2015– Jun 2017
- Measured the melting/solidification points and the latent heat of fusion of paraffin by differential scanning calorimetry (DSC) and the emissivity of paraffin via a comparison method of the radiative thermal energy.
 - Used IR imaging technique to capture the pore-scale temperature fields and analyzing quantitatively the local thermal non-equilibrium effect during melting between paraffin and copper ligaments.

Study of moisture transfer properties of porous autoclaved aerated concrete (AAC)

Feb 2015– Sept 2015

- Carried out moisture adsorption and desorption experiments to explore the effects of porosity, relative humidity (RH) and temperature on moisture transfer characteristics of porous AAC. Employed capacitive hygrometers to monitor dynamically the RH distribution inside AAC.

Experimental determination and fractal modeling of the thermal conductivity of AAC

Mar 2014– May 2015

- Conducted measurements for thermophysical properties of AAC, including the thermal conductivity by transient plane source (TPS) technique (Hot Disk) and specific heat capacity by DSC.
- Proposed a three-phase fractal model based on the reconstruction of the porous AAC by self-similar Sierpinski carpet to predict the effective thermal conductivity as a function of the moisture content.

Graduate Teaching Assistant, School of Energy Engineering, Zhejiang University

Sept 2014– Jun 2015

Thermal Fluids Laboratory at Undergraduate Level

AWARDS AND HONORS

- **David Hinde Memorial Award**, University of Illinois at Urbana Champaign, 2020
- **H.C. Ting Fellowship**, University of Illinois at Urbana Champaign, 2017
- **DaBeiNong Scholarship (2/26)**, Zhejiang University, 2016.
- **Outstanding Graduate Students Award**, Zhejiang University, 2016.

PUBLICATIONS

Peer-Reviewed Journal Papers

- J1. **Hong-Qing Jin**, Hrushiksha Athreya, Sophie Wang, Kashif Nawaz, Surface induced crystallization fouling by calcium carbonate. *Langmuir*, under review.
- J2. **Hong-Qing Jin**, Shantanu Shahane, Yuheng Zhang, Sophie Wang, Kashif Nawaz, Modeling of crystallization fouling on a horizontal-tube falling-film evaporator for thermal desalination. *International Journal of Heat and Mass Transfer*, **178**, 121596, (2021).
- J3. **Hong-Qing Jin**, Sophie Wang, Experimental study of refrigerant (R-134a) condensation heat transfer and retention behavior on paraffin-coated vertical plates and fin structures. *Journal of Heat Transfer*, **142(8)**, (2020).
- J4. **Hong-Qing Jin**, Li-Wu Fan, Min-Jie Liu, Zi-Qin Zhu, and Zi-Tao Yu, A pore-scale visualized study of melting heat transfer of a paraffin wax saturated in a copper foam: Effects of the pore size, *International Journal of Heat and Mass Transfer*, **112**, 39-44, (2017).
- J5. Li-Wu Fan, **Hong-Qing Jin**, Local thermal nonequilibrium during melting of a paraffin filled in an open-cell copper foam: a visualized study at the pore-scale. *Journal of Heat Transfer*, **139(3)**, 034505, (2017).
- J6. **Hong-Qing Jin**, Xiao-Li Yao, Li-Wu Fan, Xu Xu, Zi-Tao Yu, Experimental determination and fractal modeling of the effective thermal conductivity of autoclaved aerated concrete: Effects of moisture content, *International Journal of Heat and Mass Transfer*, **92**, 589–602, (2016).
- J7. **Hong-Qing Jin**, Xiao-Li Yao, Si-Yang Yi, Li-Wu Fan, Xu Xu, Zi-Tao Yu, Jian Ge, Experimental study of moisture adsorption and desorption properties of autoclaved aerated concrete with various porosities, *Energy Engineering*, **6**, 42-50, (2015). (in Chinese).

Refereed Conference Papers

- C1. **Hong-Qing Jin**, Sophie Wang, Experimental study of refrigerant (R134a) condensate retention on paraffin coated plates and fin structures, Paper No. HT2019-3508, *Proceedings of the ASME Summer Heat Transfer Conference*, July 15–18, 2019, Bellevue, WA. USA.
- C2. **Hong-Qing Jin**, Yuchen Shen, Wentao Ni, Sophie Wang, Experimental Study of Condensation Heat Transfer of R134a on Oil-infused Metal Foams, Paper No. 2274, *17th International Refrigeration and Air Conditioning Conference*, July 9–12, 2018, West Lafayette, IN. USA.
- C3. **Hong-Qing Jin**, Li-Wu Fan, Melting of a phase change material filled in a metal foam: A visualized study at the pore-scale using infrared imaging, Paper No. HT2016-7338, *Proceedings of the ASME Summer Heat Transfer Conference*, July 10–14, 2016, Washington, D.C. USA.

COMPUTER SKILLS

- Python, LabVIEW, SolidWorks, AutoCAD, ANSYS Fluent, Origin, EES, Microsoft Office, FLIR R&D software, and MATLAB.