

Jingwei Wu

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EDUCATION

Ph.D. of Mechanical Engineering [Expected December 2024]

University of Illinois Chicago, Chicago, Illinois, USA

Dissertation: Aerosolization Suppression and Nanoparticulate Filtration by Means of Innovative Polymer Usage

Advisor: Dist. Prof. Alexander L. Yarin

Master of Science Mechanical Engineering [May 2019]

University of Illinois Chicago, Chicago, Illinois, USA

Bachelor of Energy and Power Engineering [June 2018]

Chongqing Jiaotong University, Chongqing, China

RESEARCH INTERESTS

- Nanofibers (Electrospinning; Solution blowing; Supersonic blowing)
- Filtration (Filter material; Water filtration; Air filtration)
- Aerosolization (Aerosols suspension)
- Droplet impact (Rebound suspension)
- Fluid mechanics and heat transfer

TECHNICAL SKILLS

Coursework: Fluid Mechanics; Mathematical Methods for Engineering; Experimental Methods for Engineering; Micro-Nano Transport Phenomena; Numerical Engineering; Advanced Fluid Mechanics.

Laboratory equipment: High-speed camera; DSLR camera; Thermal camera; High-voltage power source; Cavitron and scaler; Vacuumed oven; 3D-printer; CNC machine; Atomic absorption spectrometer (AAS); Optical microscope; Sputter coater; Scanning electron microscopy (SEM); Aerosolizer.

Software and Coding: MATLAB (advanced), SolidWorks (Intermediate), C++ (basic).

Languages: Chinese (native), English.

RESEARCH EXPERIENCE

Graduate Research Assistant

[May 2019 - November 2024]

University of Illinois Chicago, Chicago, Illinois, USA

Conducted research on:

- Water filtration by means thermo- and pH- responsive adaptable intelligent filter material.
- Air filtration of nanoparticles by means of the van der Waals and Coulomb forces.
- Aerosolization fully suspension in dental procedure during COVID pandemic.
- Droplet impact and rebound suspension on dielectric surface.
- Boiling heat transfer and thermal imagery observation.

Published several papers on leading peer-reviewed journals with 100+ citations in total.

MEETING AND CONFERENCE

Meeting:

Jingwei Wu, Alexander L. Yarin, Behnam Pourdeyhimi, “Adaptable – Intelligent Filter Media”, Bi-annual industrial board research review meetings at The Nonwoven Institute. Raleigh, North Carolina, USA (December 2021 – December 2024).

Conference:

Jingwei Wu, Alexander L. Yarin, “Dilute polymer solutions completely suppress aerosolization in dentistry preventing COVID-19 transmission”, APS Division of Fluid Dynamics. Phoenix, Arizona, USA (November 2021).

Jingwei Wu, Alexander L. Yarin, “Filtration Through Thermo-sensitive Hydrogel Membranes”, APS Division of Fluid Dynamics. Washington, DC, USA (November 2023).

TEACHING EXPERIENCE

Graduate Teaching Assistance

Leading experiment sections; Leading class discussions; Designing course materials; Exam and homework preparation; Proctoring and grading; Holding office hours.

- Fluid Mechanics [2019 - 2020]
- Experimental Methods in Mechanical Engineering [2020 - 2021]
- Nano-transport Phenomenon [2021 - 2022]
- Advanced Fluid Mechanics [2022 - 2023]

PUBLICATIONS

- Jingwei Wu, Behnam Pourdeyhimi, Alexander L. Yarin. “Adaptable Intelligent Filter: Nanotextured Nonwoven Membranes Containing Water-insoluble Hydrogels”, *Journal of Applied Physics* 135, 084901 (2024).
- Jevon Plog, Jingwei Wu, Yasmin J. Dias, Farzad Mashayek, Lyndon F. Cooper, and Alexander L. Yarin. “Reopening dentistry after COVID-19: Complete suppression of aerosolization in dental procedures by viscoelastic Medusa Gorgo.” *Physics of Fluids* 32, 083111 (2020).
- Abhilash Sankaran, Jingwei Wu, R. Granda, V. Yurkiv, F. Mashayek, and A. L. Yarin. “Drop impact onto polarized dielectric surface for controlled coating.” *Physics of Fluids* 33, 062101 (2021).
- Kailin Chen, Jingwei Wu, and A. L. Yarin. “Electrospun membranes filtering 100 nm particles from air flow by means of the van der Waals and Coulomb forces.” *Journal of Membrane Science* 644, 120138 (2022).
- Vitaliy Yurkiv, Jingwei Wu, Subhayan Halder, Rafael Granda, Abhilash Sankaran, Alexander L. Yarin, and Farzad Mashayek. “Water interaction with dielectric surface: A combined ab initio modeling and experimental study.” *Physics of Fluids* 33, 042012 (2021).
- Subhayan Halder, Rafael Granda, Jingwei Wu, Abhilash Sankaran, Vitaliy Yurkiv, Alexander L. Yarin, and Farzad Mashayek. “Air bubble entrapment during drop impact on solid and liquid surfaces.” *International Journal of Multiphase Flow* 149, 103974 (2022).

PATENT

- L. Yarin, L. F. Cooper, J. Plog, J. Wu, Y. J. Dias, and F. Mashayek, “Irrigation solution to reduce/eliminate aerosol generation during dental and surgical procedures,” Provisional Patent Application UIC 2020-172-01 (2020).