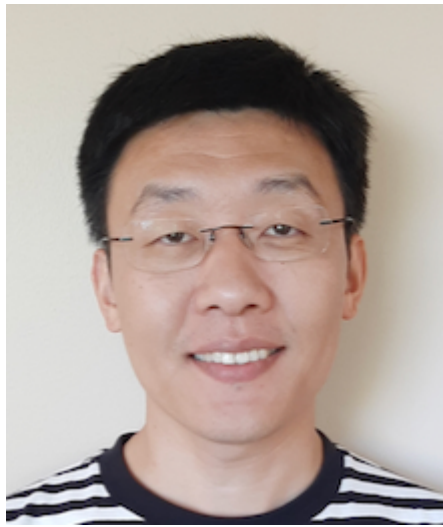




Jia Zhao

Associate Professor

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Summary of research interests

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Spring 2024

Math 372	Section 01 :	Dynamical Systems
	MWF 11:30 - 1:00	CW-325
Math 488A	Section 01 :	Problem Solving
	MWF 9:40 - 11:10	CW-325

Office: WH 126

Courses:

* Personal Website

- <https://bingdev.binghamton.edu/jzhao10>

Research Interests

I am trained as an applied and computational mathematician, aiming to strike a balance between mathematical modeling, numerical analysis, and high-performance simulations, while my application domains are multiphase complex fluids and mathematical biology. My research is highly interdisciplinary, sitting at the interface between applied mathematics, scientific computing, soft matter physics, and mathematical biology. Here are several projects I have been working on:

- Machine learning and deep neural networks on PDE model discovery
- Computational modeling of how living cells utilize LLPS to organize chemical compartments
- Hydrodynamic Models of Biofilms (biofilm formation, antimicrobial persistence, quorum sensing)
- Modeling Eukaryotic Cell Mitotic Dynamics (mitotic rounding, cell oscillation, cell motility and cytokinesis)
- Complex Fluids Model Development (multiphase fluids, active liquid crystals, viscoelastic fluids)
- Fluid Structure Interactions (FSI) in Complex Fluids with Applications in Biology and Medicine
- Modeling and Design of Multifunctional Polymeric Rod-like Nano-composites
- Accurate, Efficient and Stable Numerical Schemes for Multiphase Complex Fluids Models
- Deep Neural Network for solving Partial Differential Equations
- Software Development on Hybrid CPU-GPU Architecture

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