Vision

Iowa State University will lead multiphase flow science and engineering research with applications in energy, sustainability, healthcare, materials design, advanced manufacturing, and critical infrastructure.

Mission

We have joined forces to:

» Integrate the activities and expertise of individual research leaders to accelerate knowledge transfer

» Broaden the impact of multiphase flow research

» Conduct critical, unique, and high-risk research

» Become an intellectual resource for industry and government

» Effectively serve the needs of a variety of stakeholders

» Develop a skilled workforce

IOWA STATE UNIVERSITY
Center for Multiphase Flow Research and Education

LEFT

TOP

RIGHT

BOTTOM

IOWA STATE UNIVERSITY
College of Engineering

Center for Multiphase Flow Research and Education (CoMFRE)
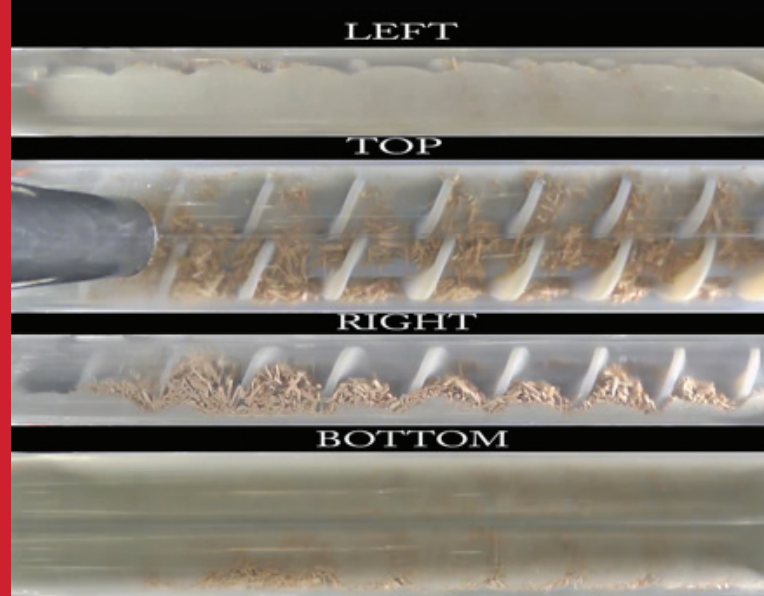
CoMFRE Research

Multiphase flows are ubiquitous and cover a range of length and time scales. Iowa State University has a critical mass of CoMFRE-affiliated faculty working in this area using a variety of theoretical, computational, and experimental resources.

Center for Multiphase Flow Research and Education

Iowa State University
2624 Howe Hall, 537 Bissell Rd
Ames, IA 50011-1096

For more information

Please contact:
Dr. Theodore (Ted) J. Heindel, Director
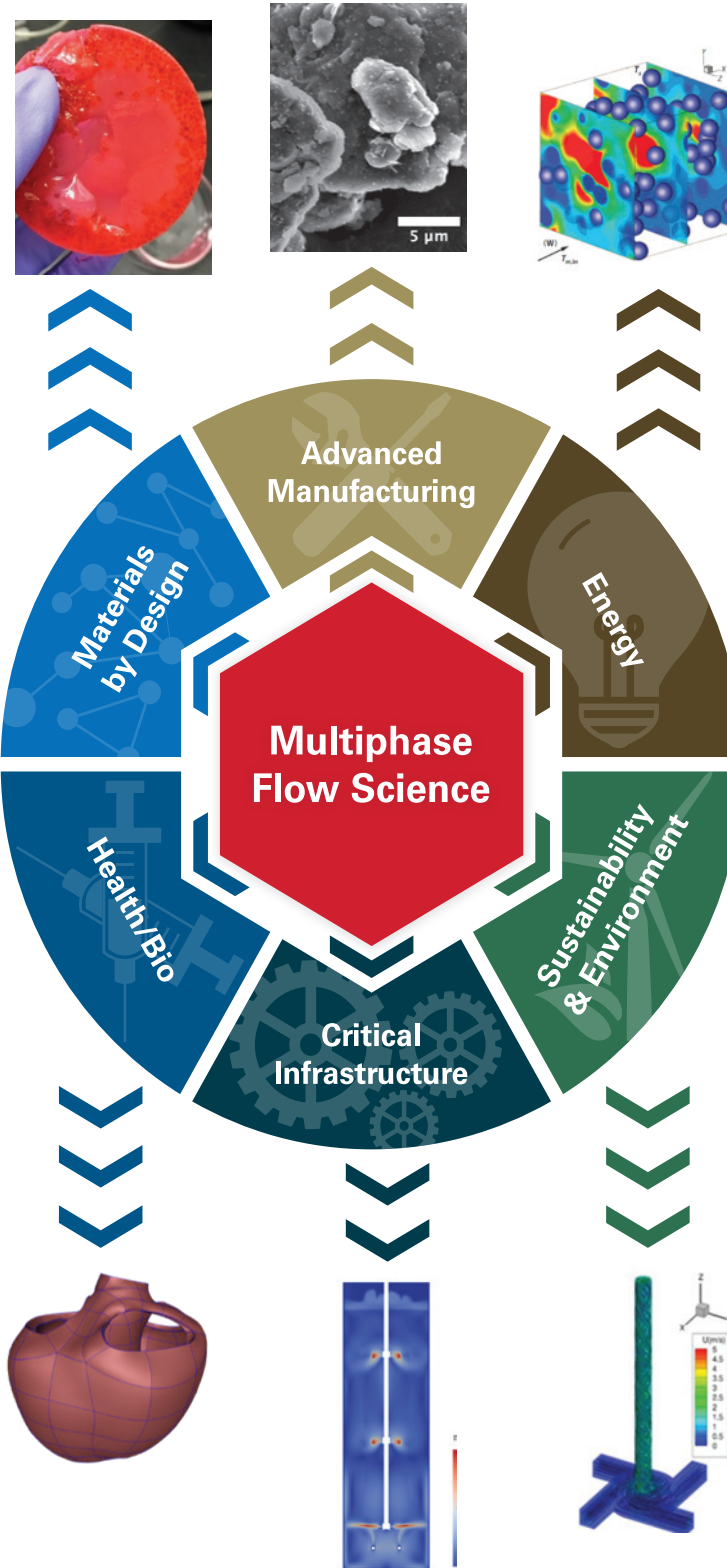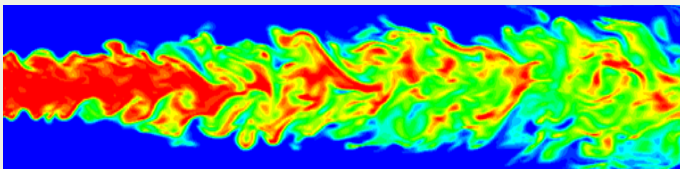+1.515.294.0057
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Unique CoMFRE capabilities

Experimental

» X-ray flow visualization and Computed Tomography Imaging (XCT)

» Fabrication and combustion of energetic/nanoenergetic materials

» Velocimetry by Femtosecond Laser Electronic Excitation Tagging (FLEET)

» Radiation transport diagnostics in algal photobioreactors

» Advanced goniometry

» Boiling heat transfer from nanoscale patterned surfaces

» Experimental rheometry and tribology

» Nanomanufacturing feedback control

» Optofluidics, biomaterials, and Lab-on-a-Chip

Computational

» Particle-resolved Direct Numerical Simulation (PUReIBM)

» Quadrature-based moment methods (OpenQBMM)

» DNS, DEM, RANS, LES, Eulerian-Eulerian, Eulerian-Lagrangian capabilities

» GPU-accelerated computer-aided design

» Uncertainty quantification

» Big data analysis

» Fluid-structure interaction

Multiphase Flow Science

- Advanced Manufacturing
- Materials by Design
- Energy
- Health/Bio
- Sustainability & Environment
- Critical Infrastructure

Benefits of industry membership

» **Research**: Members receive quarterly newsletters and gain early access to fundamental research in multiphase flow.

» **Industry Advisory Board** (IAB): Member representatives have exclusive rights to recommend multiphase flow problems of interest to industry and provide feedback on research developments.

» **Networking**: Members participate in scientific exchange with faculty, students, and other members at CoMFRE's annual meeting.

» **Low Indirect Costs**: 80% of the membership fee funds research the member can direct.

» **Internships**: Members have access to a talented pool of potential interns. CoMFRE also welcomes industry scientists as visiting scholars.

» **Recruitment**: Members have the inside track to hire CoMFRE students and researchers who are highly skilled in multiphase flow science and engineering.

» **Promotion**: Branding opportunities exist for members to promote their organization within CoMFRE, Iowa State University, and the outside world. These include, but are not limited to, postdoctoral fellowships, seminars, and conferences.

Membership levels:

» $50,000 for companies with more than 500 employees

» $25,000 for companies with 100-500 employees

» $5,000 for companies with fewer than 100 employees

» $1,000 for non-profit entities