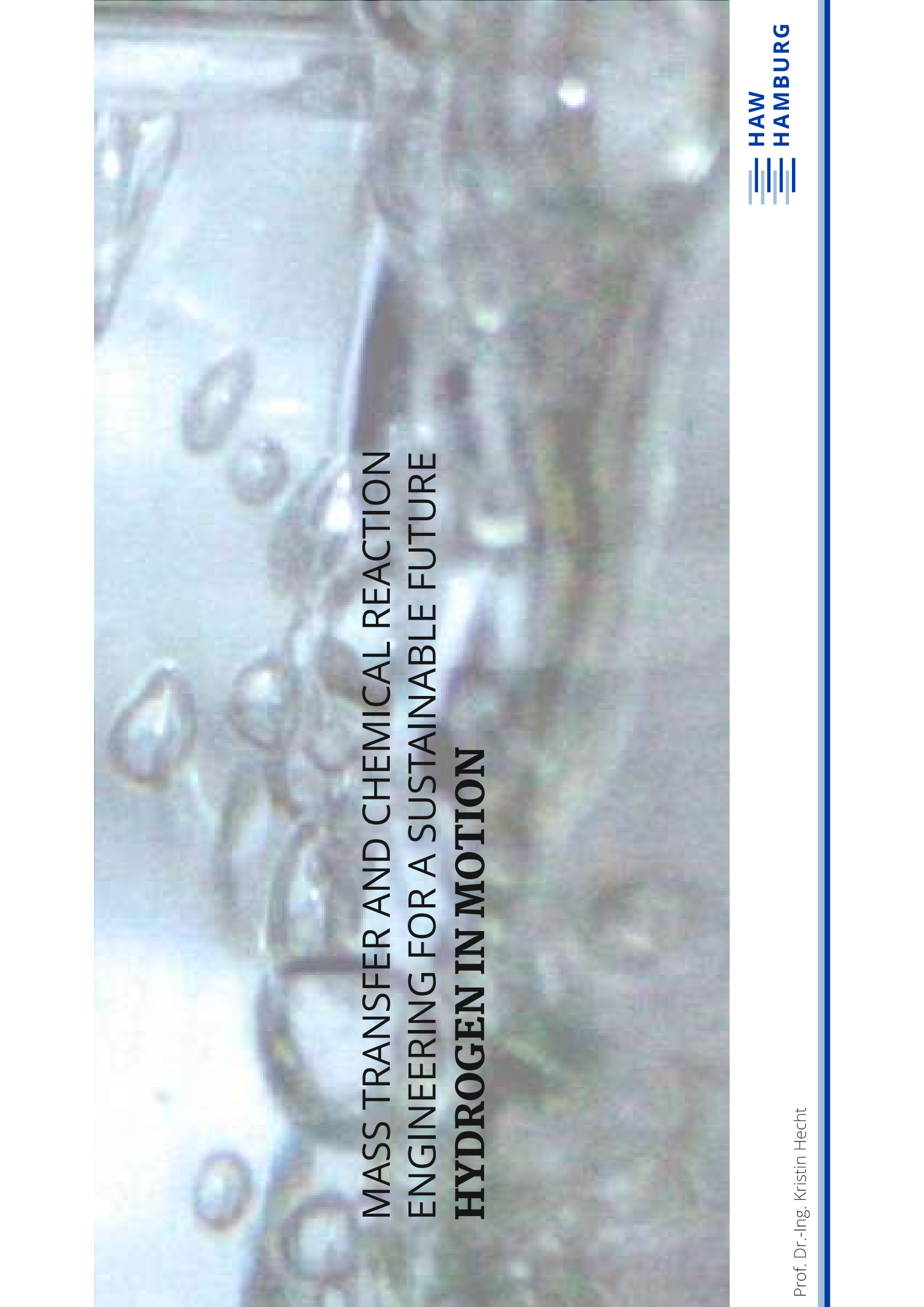




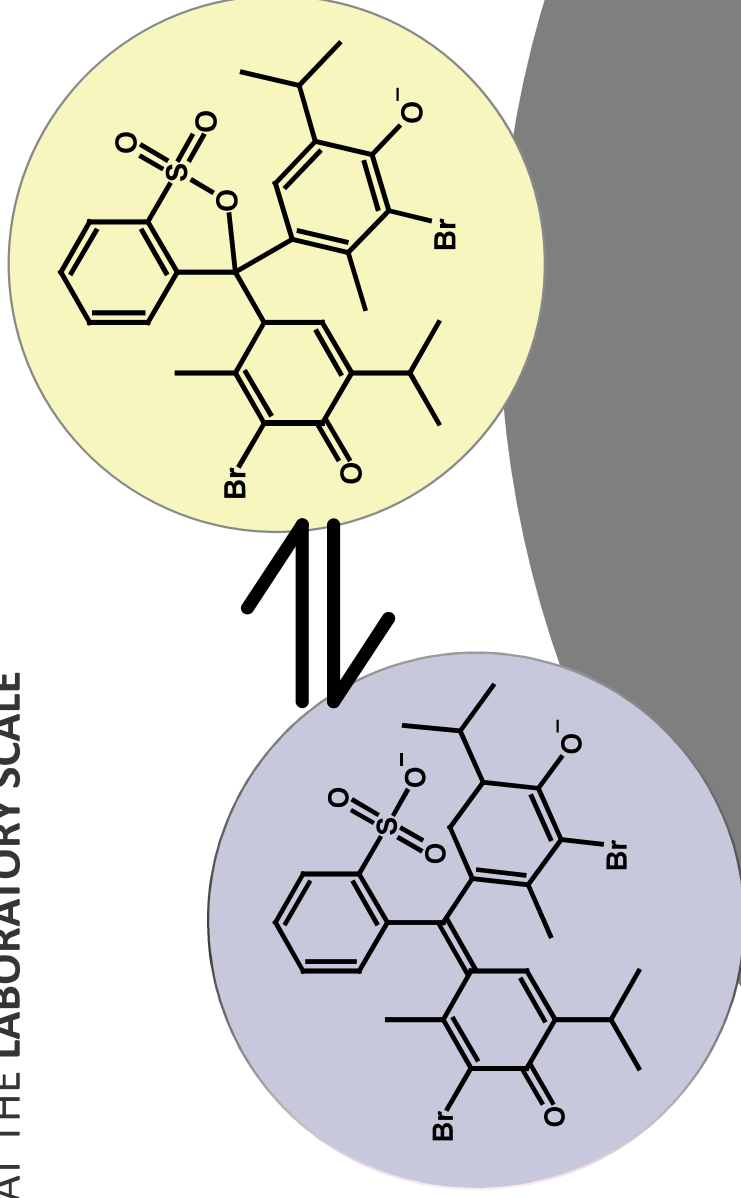
MASS TRANSFER AND CHEMICAL REACTION ENGINEERING FOR A SUSTAINABLE FUTURE **HYDROGEN IN MOTION**

Prof. Dr.-Ing. Kristin Hecht

Research Topics: Prof. Kristin Hecht

- **Hydrogen Technologies in the Process and Energy Industries:** Hydrogen as a key reactant for future sustainable chemical production.
 - Transport, solubility, mixing, and mass transfer in multiphase systems.
 - Reaction engineering: hydroformylations, hydrogenations, oxidations, halogenations.
 - CO₂ capture with cryogenic and solvent-based processes.
 - Safety and automation concepts for autonomous operation.
- **Process Intensification and Sustainable Process Development:** Innovating compact and efficient process technologies that minimize resource and energy use.
 - Novel systems (emulsions, foams, thermomorphic mixtures, nanobubbles, microreactors) for selective and efficient conversion.
 - Advanced modeling and simulation to guide process design and optimization.
- **Power-to-X and System Integration:** Adapting chemical processes to renewable energy systems and dynamic operation.
 - Electrification and automation of processes for resource-efficient operation.
 - Modular plant designs compatible with intermittent renewable power.
 - Flexible process control strategies for stable operation under fluctuating conditions.

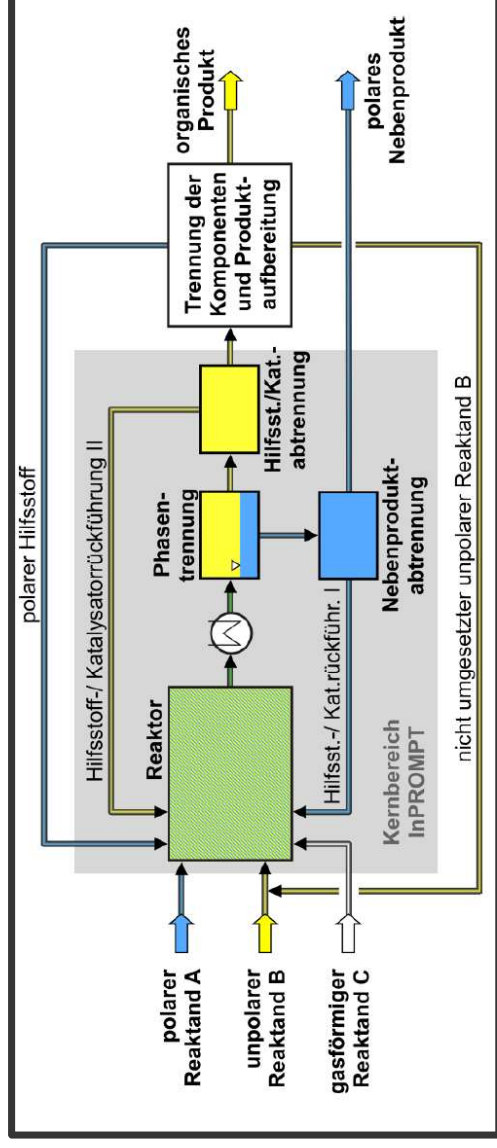
MIXING GASES AND LIQUIDS AT THE LABORATORY SCALE



Integrated Chemical Processes in Liquid Multiphase Systems (InPROMPT)

A10: Gas/Liquid Mass Transfer in Reactive Multiphase Systems

- Exploring the addition of different functional groups (C, N, O) to a biobased feedstock using novel phase systems (emulsions, thermomorphic phase systems)



Mass Transfer of Hydrogen in Innovative Phase Systems

Investigations in a microscale falling film reactor

