Reactive Multiphase Flows

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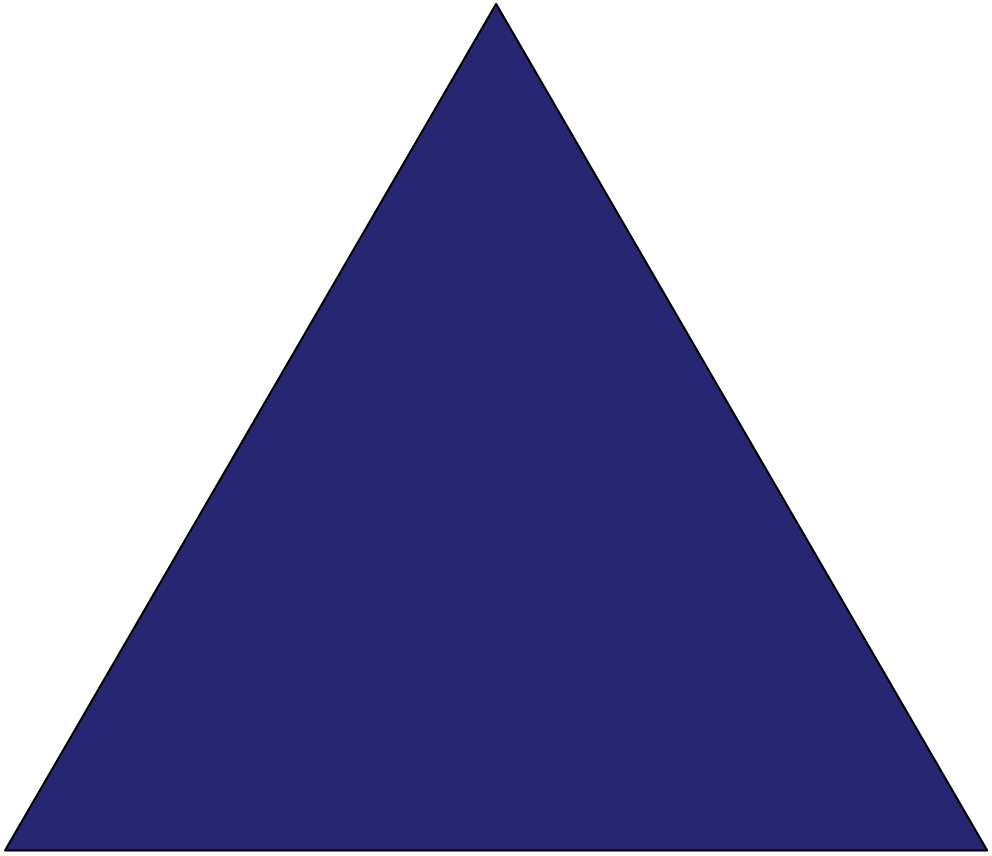
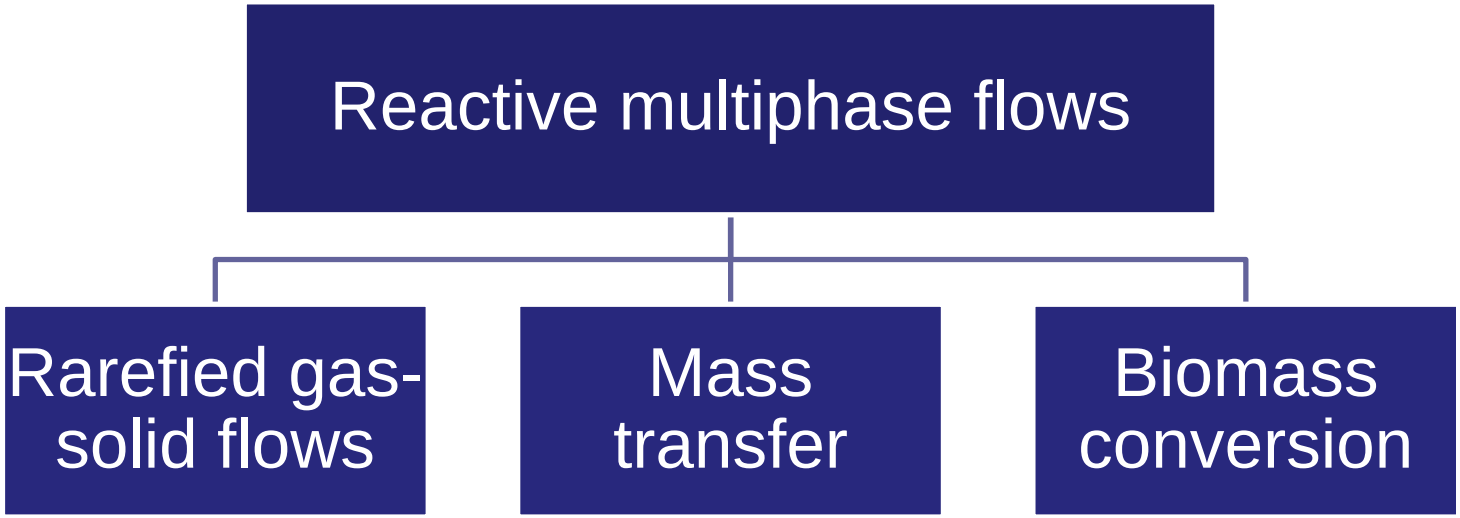
Fluid mechanics



Energy technology

Chemical engineering


Reactive multiphase flows
Rarefied gas-solid flows
Mass transfer
Biomass conversion

Rarefied gas-solid flows

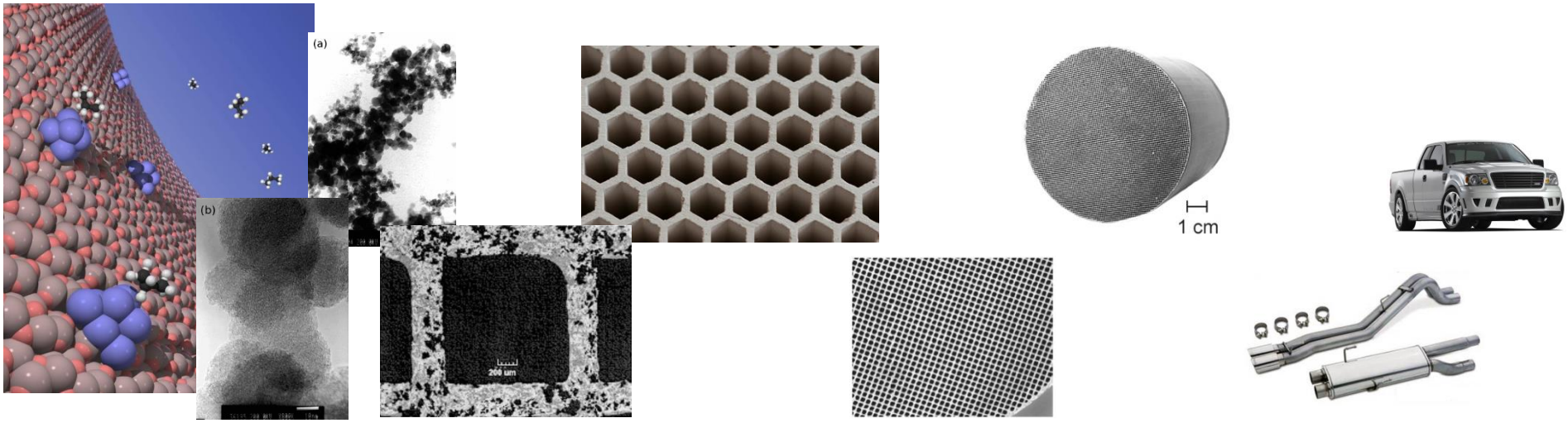
- Brownian motion
- Emission abatement
- Realistic particulate matter
- Particle transformations
- Linking to heterogeneous catalysis at the nano-scale

Mass transfer

- Single- and multiphase flow through porous media
- Fixed and fluidized beds
- Gas-liquid flows
- Linking to electrochemistry and biotechnology

Biomass conversion

- Drying, devolatilization and combustion
- Ash chemistry of “challenging” fuels
- Various reactor configurations
- From wood and pellet stoves to industrial ovens
- Linking to emission formation and operator behavior



Wide range of scales → Wide range of computational techniques:

- Discrete Simulation Monte Carlo (DSMC) / “regular” Monte Carlo
- Multiphase DNS (CFD)
- Averaged/filtered CFD
- Multiscale CFD (particle scale + multi-particle scale + gas phase)
- Global or detailed kinetic schemes