Electrical Actuation of Droplets for Microelectronics Cooling

**Objective**
Develop technologies enabling electrical actuation and control of droplets for providing chip-integrated thermal management solutions

**Approach**
- Electrowetting based actuation of generic droplets using DC and AC actuation
- Fundamental study of droplet frequency response
- Experimental characterization of droplet flow and heat transfer
- Electrically tunable thermal resistance switch through control of droplet states on artificially roughened surfaces

**Advantages**
- Significantly enhanced control of flow at the microscale
- High liquid velocities at low voltages
- Noiseless, very low power consumption
- Solutions for chip-level and hot-spot thermal management

**Selected Publications**