

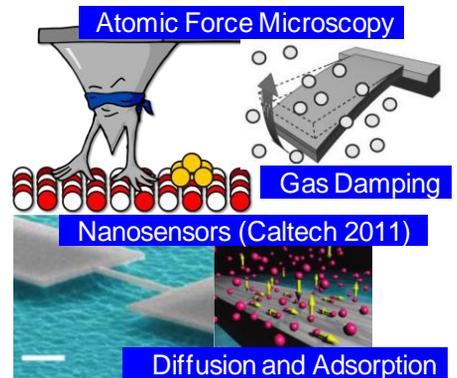


IZTECH Micro & Nano Engineering Group is actively recruiting motivated students with an interest in fulfilling a Master or PhD degree in **Mechanical Engineering**. Topic areas focus on the integration of mechanical engineering and computational theories and techniques for molecular level investigation across Nano-Technology, Microfluidics, Heat Transfer, and Molecular Dynamics domains.

Research Topics:

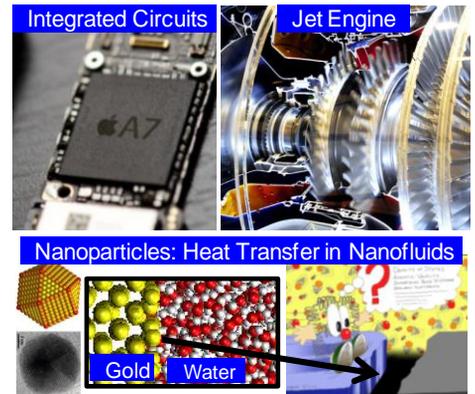
■ Nano Scale Gas Transport

Gas flows in nano-confinements are observed numerous revolutionary applications of current technologies. Some examples are given on the right. Classical consideration of nano-scale flows are based on “dynamic similarity” between the gas flows in low pressure environments and small scale domains. However, such characterization neglects the surface force interactions between gas and wall molecules which induce substantial variations. In order to characterize these currently unknown nano-scale effects, we will use molecular level simulations.



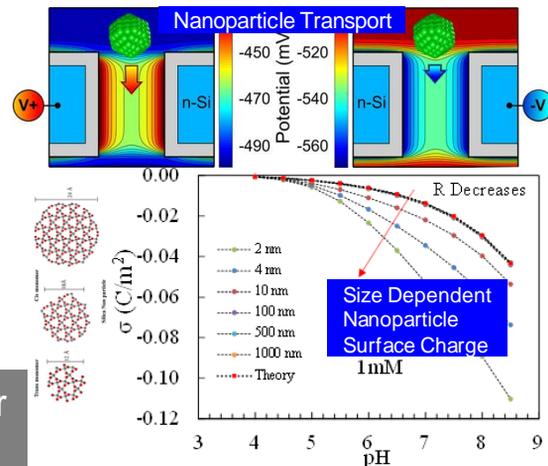
■ Nano-Scale Heat Transport

In MEMS and NEMS devices, latent heat is removed by the heat transport either to the ambient or to a coolant. In such cases, the understanding of interface thermal resistance (ITR) observed between nano-scale device components and surrounding /confined fluid, as well as between suspended nano-particles and fluid medium in nano-fluidics coolants plays a critical role. Hence, our aim is to characterize ITR for simple and complex liquid/solid couples. We will use Molecular Dynamics to understand phonon transport through the interfaces.



■ Nano-Scale Electrokinetic Phenomena

Recent advances in micro/nanotechnology attract significant attention to the use of nanoparticles in diverse ranges of applications including DNA analysis /sequencing systems, DNA and protein transport, drug delivery, biological/chemical agent detection, and micro/nanochip sensors. The performance of these devices relies on precise control and manipulation of nanoparticles. For such case, we will investigate size dependent behavior of nanoparticles. We will use atomistic modeling and COMSOL finite element modeling.



To apply, please send a CV with a transcript of your degree results, and contact info for two references.

For Additional Information:

Dr. Murat Barisik | Assistant Professor | Mechanical Engineering

Email: muratbarisik@iyte.edu.tr

Tel: 0 (537) 718 65 89