Ying Liu

G02, E-Quad, Princeton University
Princeton, NJ 08544
(917) 873-6908
YL6@PRINCETON.EDU

SUMMARY

I am interested in a broad range of problems related to fluid interfaces. I am currently studying the failure of slippery liquid infused porous surfaces. Also, I am investigating the motion of a bubble in a capillary tube driven by the gradient of surfactant concentration.

EDUCATION

Ph.D., Mechanical and Aerospace Engineering — Expected in June 2019
Princeton University, NJ, United States

B.Eng., Mechanics and Aerospace Engineering — Sep. 2010 - Jul. 2014
Peking University, Beijing, China

RESEARCH EXPERIENCE

Project: The slip-driven failure of liquid-infused surfaces and superhydrophobic surfaces
Supervisor: Prof. Howard A. Stone — Mar. 2015 - Present

- Study experimentally the failure of liquid-infused surfaces under the circumstance where the external fluid is much more viscous the infused fluid.
- Study how the air-filled cavities of superhydrophobic surfaces are filled with water under shear. In each case we systematically vary the flow rate and characterize both transient and steady-state responses.

Undergraduate Thesis Project: A Study of the Impact of a Micro-or Nanoparticle on a Droplet
Supervisor: Prof. Huiling Duan — Sep. 2013 - Jun. 2014

- Studied the dependence of impacting response between a solid particle and a water droplet on the sizes of the particle and the droplet, their relative velocity, the wettability of the particle theoretically.
- Designed a experiment and observed the micro- or nano particles are captured by the air-water interface effectively.

Project: Thermodynamic stability of bubbles on hydrophobic surfaces
Supervisor: Prof. Huiling Duan — Aug. 2012 - Sep. 2013

- Built a thermodynamic model to analyze the bubble nucleation mechanism on a superhydrophobic microstructured surface patterned with cylindrical-shaped pillars submersed under water.
- Extended the model onto nucleation on nanostructured surfaces by considering the line tension.

Project: A study of interactions between an air bubble and a solid surface in a liquid
Supervisor: Prof. Huiling Duan — Sep. 2013 - May 2014

- Constructed the integrated thin film drainage apparatus (ITFDA).
- Studied the interaction between an air bubble and a solid surface under variations of surface roughness, surface temperature, flow rate, etc.

Capstone Design: Spatially gradated segregation and recovery of circulating tumor cells (CTCs) from peripheral blood of cancer patients
Supervisor: Prof. Ray P.S. Han Sep. 2013 - Jun. 2014

- Designed a Spatially gradated PDMS-based microfluidic chip to capture CTCs.
- Improved the flow rates and reduced the blood clogging by using a surface modification method to yield hydrophilic inner walls of the microfluidic chip.

HONORS AND AWARDS

- 2013: The National Scholarship of China.
- 2013: Merit Student at Peking University.
- 2012: Yihai Kerry Scholarship at Peking University.
- 2012: Model Student of Academic Records at Peking University.

TECHNOLOGY SKILLS

Experimental Skills: Microfluidics, Confocal microscopy.
Computer Competency: Programming experience in C and C++, plus extensive knowledge of softwares, including MATLAB, Origin and Mathematica.

PROFESSIONAL AFFILIATIONS

- Member of APS (American Physical Society).