Ph.D.

Meng **Fan**

Ph.D. student at Yale University - 4th year
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Education

Yale University *New Haven, CT*
Ph.D. in Mechanical Engineering and Material Sciences *2013 - 2018 (Expected)*
- Obtained **Master of Science** Degree and **Master of Philosophy** Degree in May 2016
- Authored peer-reviewed articles and presented at three international conferences
- Related courses: object-oriented programming, numerical methods, machine learning, soft matter physics, statistical mechanics, phase transformation, fluid dynamics, turbulence, combustion, laser diagnostics

Tsinghua University *Beijing, China*
B.Eng. in Thermal Engineering *2009 - 2013*
- Related courses: thermodynamics, fluid mechanics, heat transfer, combustion, theoretical mechanics, strength of materials, machine design, turbomachinery design, engineering materials, manufacturing engineering, control engineering, measurement technology, data structure, hardware technology

University of Alberta *Edmonton, AB, Canada*
Exchange Program in Mechanical Engineering *Aug - Dec 2011*

Research and Engineering Experience

Theoretical & Computational Lab for Soft Materials, Yale University *New Haven, CT*
Dissertation Research on computational material sciences *Aug 2014 - Present*
- Led a research sub-group on a novel material (Bulk Metallic Glasses), presented progress weekly for the other 4 graduate students and 3 professors
- Upgraded a Molecular Dynamics C++ library to simulate micro & macroscopic mechanical properties of glassy materials with multiple applications in quenching, shear/compression deformation, vibration, bond order parameter (BOP) analysis, energy minimization, etc
- Carried out three research projects on bulk metallic glasses (BMGs): (1) Glass forming ability; (2) Atomic rearrangements and ductility; (3) Shear cycling and vibration. Established a theory for ductility improvement and collaborated with experimentalists to construct a BMG database
- Analyzed data in large amount with Shell, C++, Matlab and Python. Used HPCs for parallel programming

Center for Combustion Studies, Yale University *New Haven, CT*
Special Investigation on combustion *Sept 2013 - Jul 2014*
- Modeled with COMSOL (burner build-up, mesh generation, CFD modeling), TECPLOT (post processing) and CHEMKIN (constitute analysis) to study the effects of nozzle geometry on the velocity field of CH_4/O_2 counterflow diffusion flames
- Set up and conducted flame extinction and Particle Image Velocimetry (PIV) experiments of such system

Key Lab for Thermal Science & Power Engineering, Tsinghua University *Beijing, China*
Bachelor Thesis Research on combustion *Jan 2013 -Jun 2013*
- Calculated flame speed with PREMIX code coupled with different kinetic models on H_2/CO/air counterflow premixed lean flames over a large range of compositions to study the component effects on flame speed
- Conducted Particle Image Velocimetry (PIV) experiments of such system

National Institute for Nanotechnology, University of Alberta *Edmonton, AB, Canada*
Research Assistant on microfluidics *Aug - Dec 2011*
- Designed a microfluidic droplet generation system, conducted experiments and analyzed how surfactant would affect droplet geometry
- Identified a new self-assembly phenomenon: enclosure of micro-scale oil droplets within an evaporating sessile water droplet. Developed a hydrodynamic model to describe it with other researchers

Gas Turbine Institute, TurboCFD Lab, Tsinghua University *Beijing, China*
Internship on gas turbine aerodynamics *Nov 2010 - June 2011*
- Modeled a 1.5-stage axial turbine with AUTO CAD, simulated with NUMECA (a CFD package), and calculated Mach numbers and pressure throughout the turbine
- Innovated a gas turbine film-cooling blade design with a graduate student and investigated the effects of the endwall fillet and the attack angle on the film cooling effectiveness experimentally