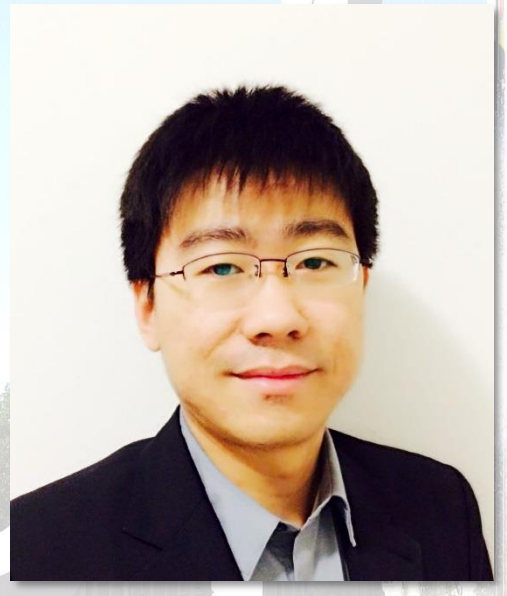
Davidson School of Chemical Engineering welcomes 2017-2018 New Faculty



Dr. Letian Dou

Assistant Professor

Dr. Letian Dou earned his PhD from University of California, Los Angeles (UCLA) in Materials Science and Engineering, and his B.S. in Chemistry from Peking University, Beijing.

Before joining the Davidson School of Chemical Engineering, Dr. Dou held research positions at UC Berkeley/Lawrence Berkeley National Laboratory/California Research Alliance by BASF, at UCLA, and at University of California, Santa Barbara. He has experiences as a teaching assistant and student mentor.

Dr. Dou was part of a research team that set a certified world record of 10.6% power conversion efficiency for organic solar cells. He has given several invited talks and conference presentations, and has also been awarded six patents. Dr. Dou has more than 30 research publications with over 7000 citations.

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The Dou Research Group

The Dou research group at Purdue University Davidson School of Chemical Engineering is interested in hybrid materials synthesis and processing for the next generation energy harvesting and optoelectronics devices. Both fundamental understanding of the materials structure-property relationships and the application in high performance energy-efficient devices are emphasized.

For the fundamental side, we aim to answer the questions of how to effectively interface inorganic and organic semiconductors at different length scales; how to manipulate the charge, mass, and heat transport for achieving better devices. The material systems of primary interests are inorganic halide perovskites and organic conjugated molecules/polymers. Using this model system, our group will focus on chemical synthesis and processing to develop new hybrid materials with desired functionality, investigate the assembly behavior and transport phenomenon at the interfaces, and integrate them into electronic and photonic devices to improve the efficiency and reliability. The knowledge we obtain and the methodology we create will be generalizable to other material systems, therefore advancing our fundamental understanding of the basic chemistry and physics at the inorganic-organic interface. The importance of controlling the materials properties in the atomic, molecular, and nanoscale level is appreciated.

For the device application side, we like to apply our new materials in a variety of high performance energy harvesting and optoelectronic devices, including solar cells, photodetectors, light emitting diodes, lasers, etc. Owning to the unique properties of the materials we design, we will pursue devices with unconventional characteristics, such as flexible, semi-transparent, and transient electronics. Another important feature of our approach is low processing cost, because the materials and devices are all solution-processed.

Students and postdocs in the Dou group will be exposed to (1) chemical synthesis and materials processing; (2) advanced structural, optical, and electrical characterizations; and (3) electronic device fabrication and measurements.

Learn more about the Davidson School of Chemical Engineering at Purdue University at https://engineering.purdue.edu/ChE

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