

*Joint Condensed Matter and Center Soft Matter and
Biological Physics Seminar*

Prof. Lei Li
(University of Pittsburg)

“Are Graphitic Surfaces Hydrophobic?”

Date/Time: Monday, March 21, 2022

4:00pm -5:00pm

In-Person: 304 Robeson Hall

Virtual: Zoom Link:

<https://viriniatech.zoom.us/j/87845053136>

Abstract: In the past ~80 years, it has been believed that the graphitic surfaces are hydrophobic. Recent experimental and theoretical works also showed that supported graphene is hydrophobic. Here, we show that graphitic surfaces are intrinsically more hydrophilic than previously believed and suggest that previously reported data on the water wettability of graphitic surfaces may have been affected by unintentional hydrocarbon contamination from ambient air. Our findings indicate stronger water–graphene interaction, which remains to be explained at the atomic level, and most wetting models for graphitic surfaces would need to be revisited. At a more practical level, the performance of graphene-based devices may be more sensitive than expected to environmental contamination from volatile organic compounds. The similar contamination effects have been observed on other 2D materials as well, indicating 2D layered materials have higher surface energy than previously believed.



Bio:

Lei Li is an associate professor of the Department of Chemical & Petroleum Engineering at the University of Pittsburgh. He obtained his bachelor's degree in chemical engineering from Tsinghua University in 1994. Three years later, he received his master's degree in polymer science from Tsinghua University. In 2001, he received his PhD degree in Macromolecular Science and Engineering from the University of Michigan. After spending nine years at Seagate Technology LLC as postdoc, research staff member, research manager and Sr. research manager, Lei Li started his academic career at the University of Pittsburgh in 2010. His research focuses on surface, interface, 2D materials and ultrathin films, ranging from polymer nano coatings, graphene surface, ionic liquid nanofilms to 3D-printed membrane for water treatment. Lei Li holds nine United States patents. Lei Li serves as the associate editor of *Frontiers in Chemical Engineering* and the academic editor of *Plos One*.