



Department of Civil & Environmental Engineering & Earth Sciences
University of Notre Dame
Environmental Engineering & Earth Sciences Seminar

Leaving No One Behind: Collectivism in Pickering Emulsion Coalescence

Tong Wu

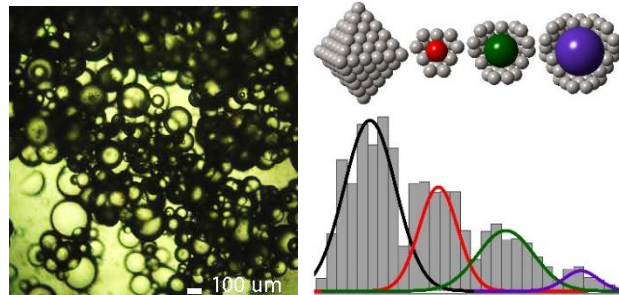
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December 11, 2014 (Thursday): 4 – 5 pm

DeBartolo Hall Room 310

Refreshments: coffee, hot chocolate, and cookies.

Pickering emulsions are made of particle-stabilized droplets suspended in an immiscible continuous liquid phase. They are important soft matter systems that form naturally in crude oils and food products and have been engineered for drug delivery, water purification, and material processing. Compared to ordinary emulsions, Pickering emulsions have shown unusual behaviors such as the formation of non-spherical droplets and the sudden halt of coalescence between individual droplets. This talk describes another, previously unreported, unusual behavior of Pickering emulsions – the simultaneous and coordinated coalescence of multiple droplets in a single event. Using latex particles, silica particles, and carbon nanotubes as model stabilizers, experimental results show that multi-body coalescence can occur in both water-in-oil and oil-in-water emulsions. The number of close packed droplets involved in the n th coalescence event equals four times the corresponding number of the tetrahedral sequence. Furthermore, coalescence is promoted by repulsive latex and silica particles but inhibited by attractive carbon nanotubes. The revelation of multi-body coalescence is expected to help better understand Pickering emulsions in natural systems and improve their designs in engineering applications.



Biosketch of the Speaker: Ms. Tong Wu is a 3rd year doctoral student at Notre Dame, studying environmental engineering. She received her undergraduate degree from Peking University in China. Her current research focuses on developing nano-enable technologies for environmental and energy applications. Ms. Wu has co-authored several scientific articles as a Notre Dame graduate student, including a recent publication in *Nature Communications*.