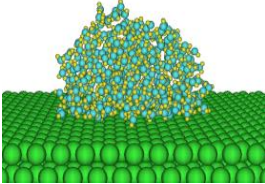
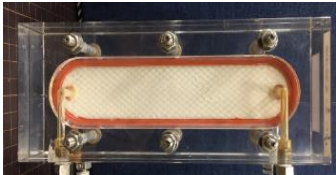
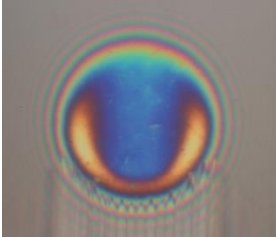
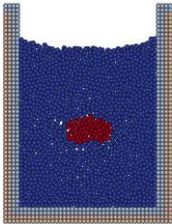
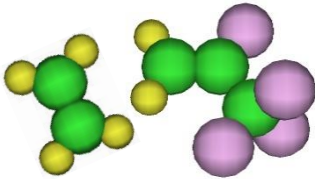


Name OKUMURA Tetsuya	Job Title Associate Professor	Area of Expertise Tribology
1. Main Research Topics We conduct both fundamental research and technological development centered on the themes of “surface” and “water.” Our investigations focus on phenomena occurring at and near solid–liquid and gas–liquid interfaces, employing experiments, analytical methods, and computer simulations. In particular, our simulations encompass a broad range of length scales—from the nanometer scale of atoms and molecules up to the meter scale—with the aim of elucidating the behaviors and underlying mechanisms of solids, liquids, and gases. ① Water desalination and Osmotic power generation Our research aims to enhance the efficiency of seawater desalination and to develop salinity gradient power generation using osmotic membranes. Through a combination of simulations and experiments, we are engaged in the following studies: • Impurity and ion transport mechanisms • Evaluating membrane performance • Recovery of membrane performance • Membrane module performance improvement   Molecular simulation Membrane test rig ② Tribology: friction, wear, and lubrication To contribute to energy and resource conservation, our research aims to achieve low friction and low wear through the development of new technologies. • Surface damage caused by raindrop impact • Reducing friction in lubrication • Mechanisms of nano-lubrication • Corrosive wear in seawater environments • Effects of hydrogen on lubrication performance   Corrosive wear Lubrication film ③ Reduction of environmental impact To address urgent global challenges, we are conducting research aimed at developing effective solutions. • Microplastic separation • Red tide mitigation via plankton capture • Next-gen refrigerant property prediction • Wind turbine blade damage reduction   Bubble simulation Molecular refrigerant analysis		
2. Keywords water, seawater, surface, interface, friction, wear, lubrication, membrane, corrosion, bubble		
3. Remarks and Websites Our research focuses on surfaces and interfaces. We undertake both technological development and fundamental studies aimed at advancing renewable energy technologies (e.g., salinity gradient power generation), promoting energy conservation (such as friction reduction), and reducing environmental impact (including removal of contaminants from water and development of novel refrigerants). Our investigations employ computer simulations and experimental validations spanning a broad range of scales, from the nanometer to the meter scale. researchmap: https://researchmap.jp/okumurat		