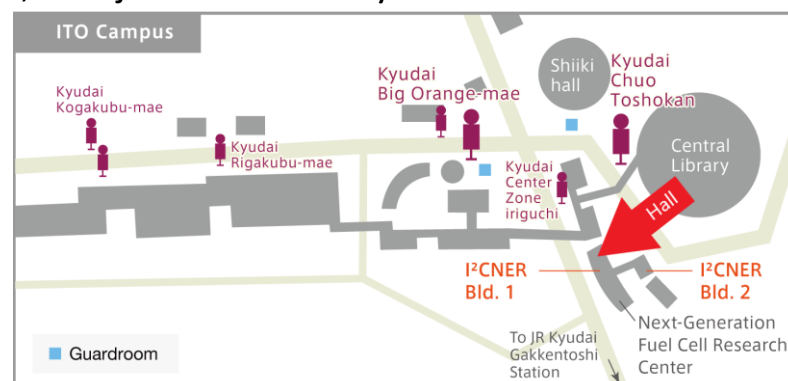


Title Formation and dynamics of in-drop micro/nanobubbles from Interfacial Hydrogen-Evolution Reaction**Speaker** Prof. Xuehua Zhang
Department of Chemical and Materials Engineering, University of Alberta, Canada**Time & Date** 10:00 AM(JST), Thursday, December 21st, 2023**Venue** Hybrid (#217, Conference Room, 2F, I²CNER Building 1, Ito Campus / Zoom Webinar)**Abstract**

The compartmentalization of chemical reactions within droplets has advantages in low costs, reduced consumption of reagents, and increased throughput. Reactions in small droplets have also been shown to greatly accelerate the rate of many chemical reactions. The accelerated growth rate of nanobubbles from nanodroplet reactions is demonstrated in this work. The gaseous products from the reaction at the nanodroplet surface promoted nucleation of hydrogen nanobubbles within multiple organic liquid nanodroplets. The nanobubbles were confined within the droplets and selectively grew and collapsed at the droplet perimeter, as visualized by microscopy with high spatial and temporal resolutions. The growth rate of the bubbles was significantly accelerated within small droplets and scaled inversely with droplet radius. The acceleration was attributed to confinement from the droplet volume and effect from the surface area on the interfacial chemical reaction for gas production. The results of this study provide further understanding for applications in droplet enhanced production of nanobubbles and the on-demand liberation of hydrogen.

About the Speaker

Professor Xuehua Zhang is a Canada Research Chair (Tier 1) in Soft Matter at Interfaces at the Department of Chemical and Materials Engineering, University of Alberta, Canada. She completed her PhD in Biomedical Engineering at Shanghai Jiao Tong University and became an Endeavor Postdoc Fellow in Australian National University. Later she was awarded with prestigious Australian Research Council Postdoctoral Fellow and Future Fellow in University of Melbourne and then became an Associate Professor in RMIT University. In 2017, she joined University of Alberta. Her research covers micro/nanobubbles on surfaces, phase separation in confined spaces, chemical reactions of nanodroplets, evaporation and dewetting of multicomponent drops and advanced surface engineering. Professor Zhang is an Associate Editor for Soft Matter – Royal Society of Chemistry.

**Registration** <https://forms.office.com/r/RiqJVZbumy>**Host** Prof. Koji Takahashi**Contact** I²CNER · Q-PIT Office of Research Support Services,
Research Support and Public Relations
TEL: +81 92 802-6935
Email: iq-kenkyu@jimu.kyushu-u.ac.jp