



大連理工大学

学術講演会

日時：2019年 **2月19日(火)** 14:00~16:00

場所：弘前大学理工学部 1号館3階 第6講義室

事前申込
不要



大連理工大学
能源与動力学院 助教
梁 剛涛 先生

Interfacial Phenomena and Heat Transfer Associated with Multi-Droplet Impingement

As a common phenomenon widely witnessed in nature, droplet impact has attracted much more attention because of its complicated mechanisms associated with manifold outcomes after impact. This includes rain droplets impact on ground, leaf, rock, lake surface and wings of aircraft, and sprinkling irrigation, as well as ink blot and coffee stain induced by impact. But, the research on the droplet impact is mostly advanced because of its significant importance in industrial applications, such as spray cooling, horizontal-tube falling film evaporation, internal combustion engine, inkjet printing and fire extinguishing. In practical technologies, a thin liquid film will be built up after liquid droplets impact on a heated solid wall, which implies that the subsequent droplets will interact with liquid film rather than solid. On the other hand, in practical view, the impingement is represented by multi-droplet impact instead of single-droplet, latter of which is however an ideal case.

This seminar will introduce a three-dimensional numerical model with an implement of a random disturbance subjected to Gaussian distribution, which was developed in Dr. Liang's research group recently. The seminar covers both interfacial phenomena and heat transfer processes during simultaneous, successive and non-simultaneous impingement of droplets on the liquid film. Research on multi-droplet impact is hopefully to fill the gap between a mass of studies on single droplet impact and the above practical applications.

Photocatalytic fuel cell using solar responsive anode and air-breathing cathode for wastewater treatment and simultaneous electricity production

With the rapid development of the society, the energy crisis due to fast depletion of fossil fuels and environmental pollution have become two critical problems facing our planet. Therefore, seeking a clean energy and developing an efficient technology to recycle the energy stored in wastewater become significant. In recent, the photocatalytic fuel cell (PFC), which is an integration of photocatalysis and fuel cell technologies, has emerged. This technology can simultaneously degrade the wastewater and generate the electricity. In PFCs, the semiconductor photocatalysts replace the precious metals used in conventional fuel cells, making them more cost-effective. Moreover, many types of organic wastes can be utilized in PFCs, which overcomes the fuel limitation in conventional fuel cells. Complex mass transport, light transmission and migration of the electron-hole pairs coupled with photoelectrochemical reactions occur in PFCs. This complex transport process is inherently associated with the photoanode structure and reactor design, which thereby affect the performance of PFCs.

This seminar will introduce a novel PFC with an air-breathing cathode and a solar responsive anode, which could enhance oxygen transport and improve the light utilization efficiency. The mass transport and electricity generation performance was investigated.



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李 林 先生

- 学生、教職員、どなたでも参加できます。
- 講演はすべて英語で行われます。

〈問い合わせ先〉

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