

Okazaki Conference

(a) The 81st Okazaki Conference Forefront of Measurement Technologies for Surface Chemistry and Physics in Real-Space, k -Space, and Real-Time

(December 2–4, 2019)

Organizers: T. Sugimoto (*IMS*), T. Kumagai (*Fritz-Haber Institute*)

Invited Overseas Speaker: A. Paarmann (*Fritz-Haber Inst.*), A. Mazheika (*Technical Univ. Berlin*), A. Urakawa (*Delft Univ. of Tech.*), C. Kley (*Fritz-Haber Inst.*), H. Freund (*Fritz-Haber Inst.*), H. Ogasawara (*Stanford Linear Accelerator Cent.*), J. Stähler (*Fritz-Haber Inst.*), L. Grill (*Univ. of Graz*), M. Rossi (*Fritz-Haber Inst.*), N. Lin (*Hong Kong Univ. of Sci. and Tech.*), R. Ernstophor (*Fritz-Haber Inst.*), S. Wu (*Fudan Univ.*), T. Kumagai (*Fritz-Haber Inst.*), Y.-P. Chiu (*Natl. Taiwan Univ.*), Y. Tong (*Fritz-Haber Inst.*)

Surface/Interface science has contributed to a wide range of disciplines in heterogeneous catalysis, electrochemistry, and semiconductor science/technology. The development of surface characterization techniques and sophisticated experiments under atomically well-defined conditions played a central role, which have also been one of the driving forces for nanoscience and nanotechnology during the last few decades. The

rapid advances of various laser sources, synchrotron facility, high-frequency electronic devices, scanning probe methods, nanoscale fabrication techniques, and computational science bring a new dimension to measurement science and technology, and a combination of different state-of-the-art techniques creates unprecedented measurement techniques for surface physics and chemistry in real-space, k -space, and real-time. In addition to the study of model systems, operand measurements have gained increasing attention to elucidate working principles of catalysts and electrochemistry. Low-dimensional materials, hybrid organic/inorganic interfaces, and molecular devices/machines are the scope of emerging measurement techniques. Theory and computational science provide indispensable tools to interpret elementary processes at the atomistic level and also pave the way for highly-efficient data analysis and material design. In the conference, we discuss the latest development of surface characterization techniques and how they can contribute to the innovation in material and energy conversion using heterogeneous catalysts and novel optoelectronic and electrochemical devices.

