

Single-Atom Catalysis

HKU SCIENCE Distinguished Lectures



October 24, 2025 (Friday)



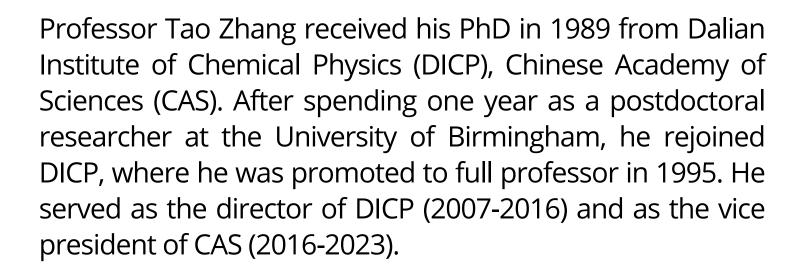
11:00 am - 12:00 pm (HKT)



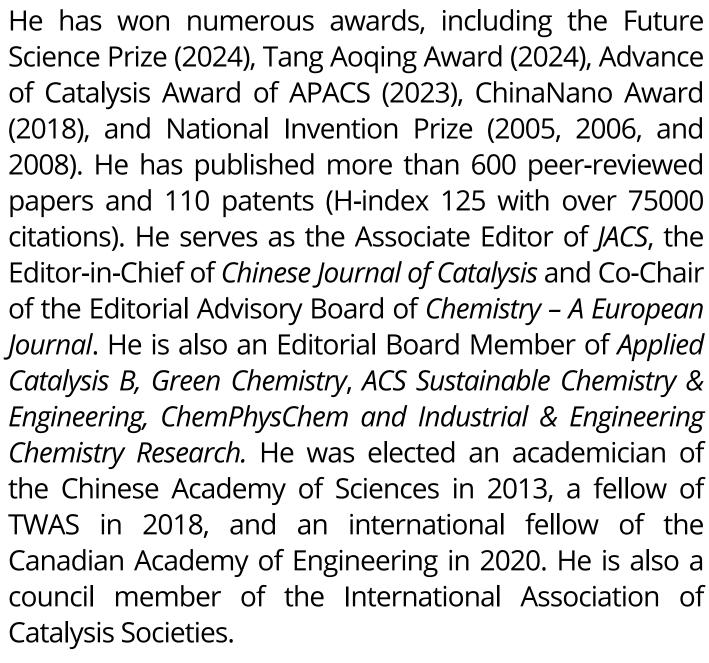
Lecture Theatre P1, Chong Yuet Ming Chemistry Building, The University of Hong Kong



Dalian Institute of Chemical Physics, Chinese Academy of Sciences



His research interests are mainly focused on Single-atom catalysis and catalytic conversion of biomass. He discovered a new catalytic process for converting cellulose to ethylene glycol in 2008 and successfully demonstrated it on a pilot scale (1000 tons/year) in 2023. Particularly, in 2011, he coined the new concept "Single-Atom Catalysis", which is now one of the hot frontiers in chemistry.



Abstract

Single-atom catalysis has emerged as a new and possibly the most active frontier in heterogeneous catalysis, since Professor Tao Zhang and his team coined this new concept in 2011 (Nature Chemistry 2011, 3, 634-641). With the great potential for maximising the atom efficiency and the well-defined active sites in a catalytic process, single-atom catalysts (SACs) have received incredible attention. Great advances have been achieved in the past decade in the preparation of highly efficient SACs, the exploration of new reactions, as well as the understanding of catalysis mechanisms. In this lecture, Professor Zhang will introduce the fast progress of SACs and mainly focus on the research in his group to address some of the fundamental issues about single-atom catalysis, including the nature of the active sites in SACs, the essential role of the coordination structure of single atoms, as well as the dynamics of SACs during reactions. Moreover, the significant opportunities and challenges in this new field of catalysis will be discussed.

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