



Venerdì **16 GIUGNO 2023** alle ore **15:00** presso l'aula F

il Dr. Federico Franco

Dipartimento di Scienze Chimiche e Farmaceutiche
Università di Trieste, Italia

terrà il seminario dal titolo:

Molecular strategies for rational catalyst design in CO₂ electroreduction

The electrochemical CO₂ reduction reaction (CO₂RR) powered by renewable energy represents an attractive emerging technology for a sustainable production of commodity chemicals and fuels. However, the optimization of the performances of transition metal CO₂RR catalysts requires a careful rational catalyst design which, in turn, implies an in-depth understanding of the reactivity at a molecular level. In this regard, molecular catalysts are useful model systems to explore the key intermediates involved in the reaction and to rationalize the microenvironmental effects on the active metal center.

In this seminar, a molecular approach to the development of catalysts for CO₂RR will be discussed, critically highlighting: *i)* recent findings on mechanistic studies of homogeneous molecular catalysts based on earth-abundant transition metals; *ii)* encapsulation of molecularly defined active moieties into reticular materials; *iii)* novel molecular strategies for the design of hybrid nanocatalysts, based on the utilization of basic concepts of molecular catalysis and polymer chemistry to tune the performances of nanostructured catalysts.

La presenza della S. V. sarà molto gradita

Prof.ssa Sara BONACCHI

Il Direttore del Dipartimento
Michele Maggini



Short CV

Federico Franco obtained a PhD in Chemistry and Material Sciences at the Università degli Studi di Torino (2016) under the supervision of Prof. Roberto Gobetto with a thesis on the development of homogeneous molecular catalysts for the electro- and photocatalytic CO₂ reduction. In 2016, he joined as a postdoctoral fellow the group of Prof. Julio Lloret-Fillol at the Institute of Chemical Research of Catalonia (ICIQ) in Tarragona (Spain), where he focused on the mechanistic understanding of molecular catalysts and reticular heterogeneous systems for the electro- and photochemical activation of small molecules. In 2019, he moved to the Department of Interface Science at the Fritz-Haber Institute of the Max Planck Society (group of Prof. Beatriz Roldan Cuenya, Berlin, Germany), where he studied in situ/operando spectroscopy applied to nanostructured electrocatalysts, especially focusing on ammonia electrosynthesis reactions. In 2021, he incorporated as a Juan de la Cierva Researcher in the group of Prof. Emilio Palomares-Gil at the ICIQ of Tarragona, where he worked on the design and development of metal or metal oxide-based hybrid nanomaterials for electrocatalytic applications. Since April 2023, he is RTD-b at the Dipartimento di Scienze Chimiche e Farmaceutiche - University of Trieste.

