

**Postdoctoral appointee funded over 2 years** in “Gas-phase time-resolved photoelectron spectroscopy in biological and chemical catalysis” at CSIC-ICMM, Instituto de Ciencia de Materiales de Madrid within the Consejo Superior de Investigaciones Científica, in collaboration with the small quantum systems (SQS) group at the European XFEL facility in Hamburg.

**Brief description of our research group:**

Our research group is focused on the development and application of advanced spectroscopic tools for the design of active catalysts for water oxidation, proton reduction, and methane to methanol production processes. Currently the development of artificial photosynthetic assemblies and biological mimics of naturally methane oxidizing enzymes is of great interest and has drawn significant attention by exploring molecular catalysts based on 3d transition metal complexes. However, despite emerging design principles, there is an urgent need to correlate the performance and stability of a catalyst to its geometric structure and electronic configuration for its rational development. Our group has a vast experience in steady-state and time-resolved X-ray based spectroscopic approaches to understand chemical catalysis. Our studies involve the interplay of several disciplines including synthetic inorganic chemistry, electrochemistry, kinetics, and spectroscopy.

**Project Description:** The project will consist in studying artificial photocatalytic assemblies through gas-phase time-resolved X-ray photoelectron spectroscopy with femtosecond temporal resolution. The postdoctoral fellow will be actively involved in conducting part of the project within the small quantum systems (SQS) group at the European XFEL facility in Hamburg. The main objectives of the project will be to explore the light-induced intramolecular electron transfer dynamics and catalytic species within multiple earth-abundant photocatalytic assemblies. The results will in the long term be complemented with liquid-phase ultrafast X-ray spectroscopic studies.

**Candidates are required to submit a complete updated CV, a brief description of their previous research, and a motivation letter. Applications should be sent to the email [dooshave.moonshiram@csic.es](mailto:dooshave.moonshiram@csic.es) before February 25<sup>th</sup> 2023.**