Università Ca'Foscari Venezia

PROJECT ACRONYM AND TITLE: **CoCaWS - Confined catalysis in layered materials – A transformational approach for efficient water splitting**

FUNDING PROGRAMME: **HORIZON 2020**

CALL: **H2020-MSCA-IF-2019 – Marie Sklodowska-Curie – Standard European Fellowship**

DESCRIPTORS: **Water splitting, Catalytic materials, Photocatalysis, Heterogeneous catalysis, Electrochemistry, Electro dialysis, Microfluidics, Sensors**

HOST DEPARTMENT: **Department of Molecular Sciences and Nanosystems**

SCIENTIFIC RESPONSIBLE: **Alberto Vomiero**

FELLOW: **Tofik Ahmed Shifa**

FINANCIAL DATA:

Project total costs	Overall funding assigned to UNIVE
€ 171.473,28	€ 171.473,28

ABSTRACT:

Sustainable solution for global energy crisis is firmly associated with seeking energy sources other than fossil fuel. In this respect, the production of hydrogen through water splitting (WS) has been regarded as the greenest approach to power the globe. At present, the issue of realizing active and stable material capable of catalyzing WS in all pH ranges is unsolved. CoCaWS aims at exploring new efficient catalysts for overall WS to tackle the problem of global energy crisis through ecofriendly hydrogen production. I hereby propose to study a new class of efficient catalysts based on composite two dimensional (2D) layered nanomaterials. I employ the concept of confined catalysis, catalytic activities taking place in a unique nanoscale environment partitioned from the surrounding bulk space, to ensure long term efficient production of H2 from water. The van der Waals (vdW) gaps between the layers will serve as a suitable platform to confine another active species. Through this approach, I aim at solving the most critical problems in the field such as catalytic functionality in neutral media for metals or alloys and poor basal plane activity in layered 2D materials. I will make use of the most conducive research environment in UNIVE to acquire new skill/knowledge and broaden my basic knowledge on advanced characterization techniques and data interpretations. The knowledge of physical chemistry, material science, condensed mater physics, and computational chemists will be involved to confront with the complexity of the task through smooth interaction with researchers in the Department of Molecular Sciences and Nanosystems of UNIVE. The project, up on completion, will provide a significant stepping-stone in the quest for responding the escalating demand of greenest energy source. I will make every possible effort to disseminate/communicate the outcomes of CoCaWS to broad audiences ranging from schoolchildren to researchers.

Planned Start date	Planned End date
1st January 2022	31th December 2023

BENEFICIARY:

1	**Università Ca' Foscari Venezia**	**Venice (IT)**	**Beneficiary**