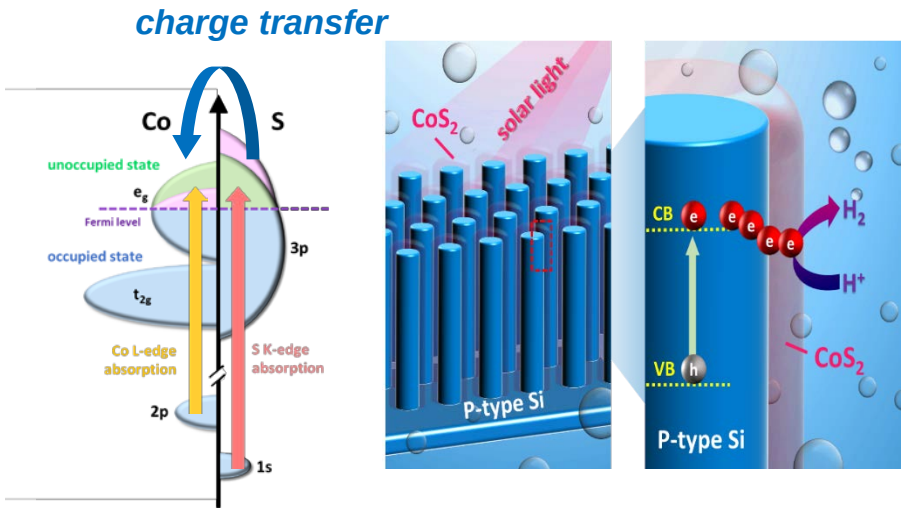
Department of Physics

Design of high efficient, economic and robust heterogeneous photocatalysts

My research interests mainly focus on design and use integration technology of semiconductor to develop non-noble metal catalysts modified on silicon structures for efficient solar water reduction. We synthesis various non-noble metal dichalcogenides as efficient co-catalysts for promoting direct solar-to-hydrogen conversion in both photochemical and photoelectrochemical water splitting systems, when combined with suitable semiconductor photocatalysts.

Techniques used in study

Integration Process technology of Semiconductors: Photolithography & Dry Etching, thin film deposition…, SEM, XRD, TEM, EDS, ALD, Linear Sweep Voltammetry, Electrochemical Impedance Spectroscopy, X-ray Absorption Spectroscopy.



Cobalt Disulfide (CoS_2) Co-catalytic Passivation Layer-modified Silicon Microwire Arrays as a Photocathode for Water Splitting

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Background:
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Funding:
Ministry of Science and Technology

Publications (corresponding author)

- Highly Efficient of Photoelectrochemical Hydrogen Generation Reaction Using Tungsten Phosphosulfide Nano-sheets, *ACS Appl. Mater. Interfaces*, 2018, **10**, 17280−17286.
- Ameliorating the Interfacial Ionic Transportation in All-Solid-State Li-ion Batteries with Interlayer Modifications, *ACS Energy Lett.* 2018, **3**, 2775–2795.
- Phosphorous-doped Molybdenum Disulfide Anchored on Silicon as an Efficient Catalyst for Photoelectrochemical Hydrogen Generation, *Applied Catalysis B: Environmental,* 2020, **263**, 118259.