

## Research project and supervisory team

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<b>Short introduction &amp; description of research project</b>	<p>The goal of this proposed project is to design and develop a dual heterojunction photocatalyst that is the S-scheme heterojunction at the <math>\text{Bi}_2\text{MoO}_6/\text{CdS}</math> interface and the Schottky heterojunction at the <math>\text{CdS}/\text{Ti}_3\text{C}_2\text{T}_x</math> interface. A comprehensive experimental and systematic study will be conducted from several aspects, such as the precursor concentrations, solvent nature, pH of the reaction medium, reaction time, stabilizer type, effect of temperature on the phase purity, thickness and size of the dual heterojunction. This project will also explore the intrinsic relationship between the thickness of co-catalyst (<math>\text{Ti}_3\text{C}_2\text{T}_x</math>) and the photocatalytic activities and the evidence of S-scheme electron-hole pairs transportation pathway across the interface. The designed heterostructures will be constructed via a self-assembly technique and will be characterized through spectral analyses and the first principle. The project will reveal that high-quality S-scheme heterojunction between <math>\text{Bi}_2\text{MoO}_6</math> and CdS will play an important role in maintaining photogenerated electron-hole pairs with strong redox abilities. Extended visible light adsorption, efficient electron-hole pairs separation, and strong redox potentials will mutually achieve.</p>
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