

**Cover image:** Pictured is a thin mesoscopic film composed of layers of titanium dioxide nanoparticles with catalytic molecular assemblies tethered to their surfaces. Upon photo illumination, water is split into its component parts, releasing molecular oxygen, protons, and electrons. When integrated into a photoelectrochemical cell, reduction of carbon dioxide can yield fuels such as methane, methanol, and/or formate. The articles included in this special issue explore the development of materials and strategies in the emerging fields of solar fuels and artificial photosynthesis. See the Introduction to the PNAS Special Feature on Chemical Approaches to Artificial Photosynthesis: Solar Fuels on pages 15560–15564 by Javier Concepcion et al. Image courtesy of Yan Liang ([l2xy2.com](http://l2xy2.com)).

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