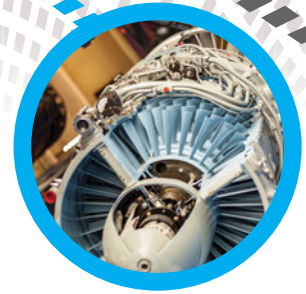


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Advanced Materials and Structures for Solar Fuels

Efficient and cost-effective generation of renewable fuels, such as hydrogen from renewable resources like solar energy, is crucial to ensure a sustainable future. Due to the lack of materials and structures, however, current technologies for renewable hydrogen production via photoelectrochemical (PEC) water splitting have significant challenges in efficiency, durability, and cost. In view of their importance in sustainable energy and environmental applications, a compilation of accomplishments in photocatalytic materials research will promote rapid advances of the field.

This *JMR* Focus Issue will present latest developments in photocatalytic materials and structures, with focus on both the fundamental materials science and their applications in solar fuels production.

Contributed articles are sought in the following areas:

- ◆ Fundamental studies of solar fuels generation via PEC water splitting
- ◆ Semiconductor materials, advanced structures, and systems for solar fuels
- ◆ Surface and interface properties of semiconductor/electrolyte junctions
- ◆ Nano-materials and heterostructures
- ◆ Overlayers, underlayers, etc. for enhanced kinetics and charge transfer
- ◆ Molecular and mesoscopic modifications of photocatalysis
- ◆ Modeling and simulation of semiconductors, interfaces, and transport processes
- ◆ Short reviews of materials and structures

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Advances and Challenges in Carbon-based Tribomaterials

Carbon-based materials have captured broad interest in the materials science community for decades. Carbon-based systems comprise an impressively broad and continually expanding range of materials, from the building blocks of biology to carbon allotropes with extreme and exotic properties such as nanotubes, buckyballs, graphene, and diamondoids.

This *JMR* Focus Issue will highlight the current understanding and remaining challenges for evaluating the potential of carbon-based materials for tribological systems. The most recent findings in the synthesis, characterization, and application of carbon-based materials will be highlighted, as well as future possibilities for new carbon-based tribological coatings.

The aims of this Focus Issue are to inform colleagues in industry and academia about methods, analysis, design advances, and new materials concerning all kinds of carbon-based materials with improved tribological properties or systems, from fundamental research to applied uses, with resulting benefits of longer product/component life, less energy consumption, and reduction in product development time and cost.

Potential papers will feature a mix of experimental, numerical, and/or theoretical articles dealing with all aspects of carbon-based tribomaterials research.

Contributed papers are solicited in the following areas:

- ◆ Adhesion
- ◆ Friction models
- ◆ New methods and technologies
- ◆ Materials transfer
- ◆ Rough surfaces
- ◆ Thermal stability
- ◆ Tribofilms
- ◆ Wear models
- ◆ Asperity interactions
- ◆ Friction and wear mechanisms
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- ◆ Tribocorrosions
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