

# Chemical Physics of Materials

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*The Journal of Chemical Physics* (JCP) has been expanding its scope dramatically in the past eighteen months,<sup>1</sup> building on the progress made in previous years. As part of this, we will be changing the name of our “Surfaces, Interfaces, and Materials” section to “Materials, Surfaces, and Interfaces,” to reflect the increased emphasis of the journal on materials. We write this editorial to provide guidance to potential authors in the broad area of materials, surfaces, and interfaces.

The Materials, Surfaces, and Interfaces (MSI) section of JCP publishes significant advances in fundamental understanding of structure, dynamics, properties, and chemical reactivity of materials, surfaces and interfaces. JCP is interested in materials of various dimensionalities and morphologies (low-dimensional, nano-, porous, molecular solid and bulk materials) and various functions (electronic, optical, magnetic, plasmonic, photonic, light harvesting, energy and charge transfer/transport, energy conversion and storage, catalysis, novel light-matter interaction, spintronics, quantum information, etc.). We encourage submissions that explore chemical systems (of any size or complexity) through the eyes of physical phenomena, concepts, and theories. Descriptions of new experimental or theoretical techniques and their application to surfaces, interfaces, and materials are also encouraged.

JCP's commitment to the MSI fields is reflected in our editorial board, and in the large representation of MSI in the recent, ongoing, and upcoming special topic issues. Since January 2019, we have added Tianquan (Tim) Lian, Emily Wiess, Xiaoyang Zhu, and Lasse Jensen to our team of editors. They and other JCP editors have been organizing excellent special topics in longstanding and emerging subfields of MSI, as listed below. Currently open and published special topic collections can be found on the journal's home page (jcp.aip.org) under “Collections”.

**2D Materials** with Xiaoyang Zhu, David R. Reichman

**65 Years of Electron Transfer** with Leif Hammarström, Cherri Hsu, Robert Cave, Emily Weiss, Tim Lian, Xiaoyang Zhu, David Manolopoulos

**Catalytic Properties of Model Supported Nanoparticles** with Štefan Vajda, Núria López, Charles Campbell, Pat Thiel, Angelos Michaelides

**Colloidal Quantum Dots** with Matt Beard, Xiaogang Peng, Zeger Hens, Emily Weiss

**Emerging Directions in Plasmonics** with, Katherine (Kallie) Willets, Emiliano Cortes, Hiroaki Misawa, Alexander O. Govorov, Emily Weiss, Lasse Jensen, Xiaoyang Zhu, Angelos Michaelides

**Excitons: Energetics and Spatio-temporal Dynamics** with Seogjoo J. Jang, Christopher J. Bardeen, Irene Burghardt, Chao-Ping Hsu, Tim Lian, Xiaoyang Zhu, Emily Weiss, David R. Reichman, Jennifer Ogilvie

**Interfacial Structure and Dynamics for Electrochemical Energy Storage** Dmitry Bedrov, Yang Shao-Horn, Robert Schlögl, Tim Lian, Angelos Michaelides, Emily Weiss

**Lead Halide Perovskites** with Xiaoyang Zhu

**Oxide Chemistry and Catalysis** with Robert Baker, Ulrike Diebold, Jeong Young Park, Annabella Selloni, Pat Thiel, Angelos Michaelides

**Photoelectrochemistry and Photocatalysis** with Dunwei Wang, Victor Batista, Can Li, Wilson Smith, Tim Lian, Emily Weiss, Angelos Michaelides

**Polariton Chemistry: Molecules in Cavities and Plasmonic Media** with Timur Shegai, Wei Xiong, Joel Yuen-Zhou, Lasse Jensen

**Singlet Fission** with David R. Reichman, Xiaoyang Zhu

**Spectroscopy and Microscopy of Plasmonic Systems** with Jon P. Camden, David J. Masiello, Bin Ren, Lasse Jensen

**Up- and Down-Conversion in Molecules and Materials** with Nobuhiro Yanai, Lea Nienhaus, Bruno Ehrler, Emily Weiss

**Quantum Light** with Andy Marcus, Michael Raymer, Carlos Silva Acuna, P. James Schuck, Jennifer Ogilvie, Qiang Shi, Xiaoyang Zhu

**Heterogeneous Single-Atom Catalysis** with E. Charles H. Sykes, Phillip Christopher, Jun Li, Angelos Michaelides, Lai-Sheng Wang, Emily Weiss

We are pleased that these special topic issues have received strong support from the community, with many quality submissions and published papers. We find, however, that there is some misconception of the types of articles that are acceptable to JCP, so we would like to clarify the journal criteria:

*“The Journal of Chemical Physics (JCP) is an international journal that publishes cutting edge research in all areas of modern physical chemistry and chemical physics. To be acceptable for publication in JCP, a manuscript must report novel research that makes a significant advance in improving scientific understanding in a modern area of broad interest.”*

What do the criteria above mean with respect to the sub-field of MSI? The great technical sophistication of today's synthetic, fabrication, spectroscopic, theoretical, and computational methods have positioned researchers to examine the complex world of MSI with the same atomistic/molecular level details and scientific rigor that have been applied to gas- and solution- phase systems for decades. Scientists are breaking down the complex processes occurring in macromolecules and materials and at interfaces into their most elementary components, and to develop methods that probe and predict the behavior of these components with the highest accuracy and precision. Such high-level “chemical-physics” investigations have led to mechanistic understanding and predictive ability, which provides foundational

knowledge for developing materials, devices and systems with desired property, function, and performance. JCP strives to be a leader in publishing papers that make significant advances *in the MSI areas* using the *afore-mentioned chemical physics* approaches. In particular, we seek papers that 1) give fundamental chemical physics/physical chemistry insight; 2) relied on the development of a substantial (theoretical or experimental) technical advance; or 3) provide significant advances in the mechanistic understanding of materials/devices. This means that papers that describe routine usage of an experimental or theoretical technique, describe a known phenomenon (or a simple extension of known phenomena), or describe materials synthesis, routine materials characterization and/or routine device performance measurements are better suited to more specialized journals.

We look forward to the continued growth of JCP in the coming years to span the breadth of the most cutting-edge chemical physics, and we welcome your most important papers on the chemical physics of Materials, Surfaces, and Interfaces.

- (1) Lian, T. (Tim). Leading JCP into the Future. *J. Chem. Phys.* **2019**, *150* (1), 010401.  
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