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Applications of Symmetry in Modern Quantum Electrodynamics

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Deadline for manuscript submissions:
closed (14 November 2021)

Message from the Guest Editors

Dear Colleagues,

Symmetry can become indispensable in the understanding and description of the resultant optical phenomena. Traditionally, the theory of QED is known for its highly precise quantification of physical constants. Today, its predictive capacity can be employed to both foresee novel phenomena and spectroscopies and produce an explanatory origin for experimental results. Cutting-edge applications of QED often utilise the spatial and temporal symmetries of the light and the material under investigation—for example, in studies related to chiroptical phenomena and chirality. Moreover, appreciation of symmetries has allowed for the elegant and simple representations of multi-photon interactions, which further engender predictive capacities in nonlinear optics. Although not limited to these ideas, we invite submissions of work that highlight new applications of QED, or summarise their status, with special attention paid to the role of symmetry in these quantised light–matter systems.

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Dr. David S. Bradshaw
Guest Editors

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Message from the Editor-in-Chief

Symmetry is ultimately the most important concept in natural sciences. It is not surprising then that very basic and fundamental research achievements are related to symmetry. For instance, the Nobel Prize in Physics 1979 (Glashow, Salam, Weinberg) was received for a unified symmetry description of electromagnetic and weak interactions, while the Nobel Prize in Physics 2008 (Nambu, Kobayashi, Maskawa) was received for the discovery of the mechanism of spontaneous breaking of symmetry, including CP symmetry. Our journal is named *Symmetry* and it manifests its fundamental role in nature.

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