Special Issue

Relativistic and QED Effects in Atoms and Molecules

Message from the Guest Editor

It is now well established and illustrated by many calculations and experiments that the structure, spectroscopy, and chemical activity of heavy atoms and molecules exhibit large relativistic and non-negligable QED effects, together with a sizeable electron correlation. All the effects, enumerated above, are in many cases of the same order of magnitude, non-additive, and strongly intertwined. In order to be eligable for benchmark atomic and molecular calculations, these effects should be included into the computational scheme on equal footing, up to high orders and sized consistently. These effects play an important role in lighter element compounds too, showing up in phenomena such as the fine or hyperfine structure of electronic states. Tremendous progress has been achieved recently in the development, computer implementation, and actual application of different levels of approximation treatment of relativistic and QED effects in atomic and molecular systems.

Guest Editor

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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.

Editor-in-Chief

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