## Umbral Calculus, Operator Theory and *Symmetry*: Applications of Different Mathematical Languages

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### Message from the Guest Editors

Dear Colleagues,

The properties of symmetry have been central to the conception of umbral calculus, which were originally developed from the calculus of differences and, more recently, on the extension of Weyl—Heisenberg group.

Umbral calculus deepens its roots into the Heaviside operational methods and into the techniques introduced since the 17th century, within the context of calculus of differences and by the English operationalist school of the 19th century. Since then, much work has been done to increase the rigor of and expand the original techniques to the extent of a much broader and more complete theory. In the second half of the last century, the umbral calculus of Roman and Rota, the theory of poweroids, the monomiality principle and the umbral indicial calculus provided further breakthroughs in this direction.

Umbral techniques make use of numerous transversal tools in various fields of mathematics, such as special functions, integral transforms, combinatorics, operator theory, mathematical analysis, and so on...

Special Issue

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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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