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Non-Standard Lagrangians and Hamiltonians in Theoretical Physics and Applied Mathematics

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Message from the Guest Editor

Dear Colleagues,

"Non-standard Lagrangians" (NSLs), which involve neither the ordinary kinetic term nor the classical potential function, form an interesting field in theoretical physics and applied mathematics despite their anomalous or irregular physical forms. They were introduced in 1978 by Arnold in his classic book "Mathematical Methods of Classical Mechanics". Nevertheless, their real implications for theoretical physics date back to 1984 when Alekseev and Arbuzov used them to describe large distances interactions in the region of applicability of classical theory, a problem which is related to the color confinement issue. Regardless of their strange properties, NSLs play a significant role in the theory of nonlinear differential equations, dissipative dynamical systems, earthquake physics, plasma physics, astrophysics, quantum mechanics, and quantum field theory, among others. They are an emerging phenomenon...

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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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