Mirror Symmetry and Algebraic Geometry

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Message from the Guest Editor

Dear Colleagues,

The Galois group of a polynomial f with integral coefficients is a measure of the symmetry of the complex roots of f and the solvability of the equation f = 0 by radicals, it is just a question of the symmetry of the roots of f.

The mirror symmetry leads the physicists to do important predictions about the rational curves on the quintic threefold, which were partially proved very late by people from Algebraic Geometry. The prediction about Gromov–Witten invariants given by the mirror symmetry is now proved mathematically in several cases. Many new fields and concepts in Algebraic Geometry appeared when people tried to give a mathematical foundation for aspects of the mirror symmetry, for example, quantum cohomology, the complexified Kahler moduli space of a Calabi–Yau threefold, Kontsevich's definition of a stable map, and Batyrev's duality between certain toric varieties and Givental's notion of Quantum Differential Equations.

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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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