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## Active Control of Asymmetrical Wake Flow in Wind Energy Systems

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### Message from the Guest Editor

The use of conventional energy resources has led to severe environmental problems, with considerable time and effort required for environmental recovery. Therefore, an increasing number of countries have focused on developing clean and renewable energy resources (e.g., solar, wave, and wind energy). Wind energy has been extensively exploited in recent decades. Wind farms are being established worldwide to harvest wind energy.

With the development of wind energy utilization, more researchers and engineers have realized the importance of wind farm layout optimization and have conducted numerous studies on the layout optimization of wind turbines in onshore wind farms. However, for the established wind farms, the layout can not be changed; therefore the active asymmetrical wake control of the wind turbines can be utilized to improve the power output.

This special Issue is focused on the wake model of the wind turbines, the CFD modeling of the interaction between the wake and the terrain, the asymmetrical wake-flow induced dynamic motions of the wind turbines, the optimization of the layout the wind farms, and the vibration-control of the wind turbines.



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# 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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