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Research on Thermoelectric Materials and Devices: New Advances in Improving Thermoelectric Efficiency

Guest Editor:

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Deadline for manuscript submissions:
20 September 2024

Message from the Guest Editor

The design of thermoelectric materials with improved efficiency in order to convert heat into electricity and vice versa has attracted a great deal of theoretical and experimental research interest in the last two decades.

The efficiency of energy conversion is measured by the dimensionless figure of merit ZT. Good thermoelectric materials are those with ZT>3 at room temperature. In principle, ZT can be increased by increasing the thermopower and electrical conductivity and by reducing the thermal conductivity. However, the interrelations between the above transport coefficients make their independent variation a challenging task.

The aim of this Special Issue is to present new developments in the optimization of ZT by tuning the electron or/and phonon transport properties of both inorganic and organic semiconductors. Theoretical and experimental studies on materials of reduced dimensionality (2D, 1D, and 0D) are particularly encouraged. Emphasis is given to band-gap engineering, the control of electron and phonon scattering mechanisms, and electron–phonon coupling (i.e., phonon-drag effect). This Special Issue will include both full research and review papers.

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Message from the Editor-in-Chief

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Journal Rank: JCR - Q2 (*Metallurgy & Metallurgical Engineering*) / CiteScore - Q2 (*Condensed Matter Physics*)

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