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Heat Transfer in Thermoelectric Modules

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Message from the Guest Editors

Thermoelectric modules are used for thermal-to-electrical energy conversion and heat management including refrigeration, cooling, heating, thermal switching, and designing active heat sinks. Passive heat transfer in these modules via conduction within the elements, but also from the side walls via radiation and convection, is important to include when modeling and designing these modules. The electronic component of passive heat transfer via electrons, holes, and bipolar transport, also within the module, adds to the complexity of the problem. In their active mode, under both electric current and temperature gradients, the active components, including the Peltier and Thomson currents and Joule heating, provide knobs to manipulate heat for various applications. The thermal integration of the thermoelectric modules with the heat source, heat sink, and ambient environment is essential in accurate heat management.

This Special Issue focuses on heat management and heat transfer in the context of thermoelectric modules. We invite papers considering materials design, device design, and applications with an emphasis on heat and entropy transfer.

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Message from the Editor-in-Chief

The concept of entropy is traditionally a quantity in physics that has to do with temperature. However, it is now clear that entropy is deeply related to information theory and the process of inference. As such, entropic techniques have found broad application in the sciences.

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