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Mathematical Models for Transport in Macroscopic and Mesoscopic Systems

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Message from the Guest Editors

In this Special Issue, the focus is placed on mathematical modeling and simulation of charge transport in graphene and other 2D materials and in structures, such as double gate MOSFETs, nanoribbons and nanowires, where the presence of confinement effects allows for the formal description of the carrier flow as that of a two-dimensional or one-dimensional electron gas. Moreover, by increasing the miniaturization of devices, hotspots are observed, that is, zones with very high crystal temperature due to the release of energy by high energetic electrons. The effect is particularly relevant in materials with reduced dimensionality and confined structures.

- Graphene
- Low-dimensional material
- Nanoribbons
- Nanowires
- Field effect transistors
- Charge and phonon transport
- Semiclassical Boltzmann equation
- Schrödinger equation
- Wigner transport equation
- Hydrodynamical models
- Ab initio calculations
- Monte Carlo simulations
- Optimization methods

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Message from the Editor-in-Chief

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