

## Special Issue

# Advances in Phase Change Materials for Enhanced Thermal Energy Storage Systems

### Message from the Guest Editor

Phase change materials (PCMs) play a crucial role in latent heat thermal energy storage (TES) systems, which are recognized as key technologies for improving energy efficiency. Despite their potential, TES systems based on PCMs still require significant research to optimize their performance. While thermal properties—particularly latent heat capacity—remain the primary selection criteria for PCMs, other factors also warrant deeper investigation and enhancement. Current research is strongly focused on improving thermal conductivity and preventing leakage, either through encapsulation techniques or the development of shape-stabilized PCMs.

However, additional aspects such as thermal cycling stability, chemical stability, flammability and fire behavior, low vapor pressure, and potential health impacts have not been as extensively explored and deserve further attention. This Special Issue seeks to compile cutting-edge research dedicated to the development, characterization, and performance enhancement of PCMs, contributing to the advancement of efficient and reliable thermal energy storage solutions.

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### Guest Editor

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