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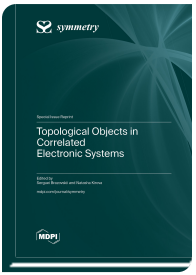
Special Issue Reprint

Topological Objects in Correlated Electronic Systems



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Most correlated electronic systems possess ground states that have broken crystal symmetries. Among these is the family of electronic crystals (charge/spin density waves, Wigner crystals, stripes, charge ordering, and electronic ferroelectrics), which are superstructures found in spin systems, such as spin-polarized density waves and superconductors. Their ground-state degeneracy allows for topologically protected configurations that connect equivalent but different states. These "topological defects" include extended objects like plane domain walls; the lines of dislocations or phase vortices; various solitons or skyrmions, which are local microscopic objects; and transient processes like phase slips and space–time vortices. Embedded or transient topologically nontrivial configurations are readily induced by doping or optical pumping, by electric or magnetic fields, or under stresses or sliding. This Reprint includes nine articles that cover the following issues:

- Topological doping in high-Tc cuprate superconductors;
- The dynamics of the patterns and networks of defects in Wigner crystals;
- The scanning probe microscopy of topological defects in multi-ferroics;
- Miorana states in a topological superconductor;
- Solitons in a ferroelectric conductor;
- The coherent X-ray diffraction of sliding solitonic lattices.

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