

Special Issue

Symmetry in Dark Matter Models

Message from the Guest Editor

Symmetry in dark matter models assumes dark matter and dark energy particles exist in equal and opposite pairs, similar to baryonic matter. Asymmetry suggests that dark matter, like visible matter, originated from an imbalance between particles and antiparticles. This asymmetry hypothesis is motivated by the observed similarity in the mass densities of dark matter (visible matter) and a common origin with visible matter, where a similar particle–antiparticle asymmetry was responsible for the survival of visible matter.

- **Symmetric dark matter:** In this model, the abundance of dark matter arises from the thermal equilibrium of particles and antiparticles in the early universe. As the universe cooled, the expansion rate outpaced annihilation, leaving a relic abundance of particles. The abundance is often determined by the interactions between dark matter and standard model particles.
- **Asymmetric dark matter (ADM):** This model suggests that dark matter has a similar origin to the observed baryon asymmetry: a primordial imbalance between matter and antimatter...

Guest Editor

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Message from the Editor-in-Chief

Symmetry is ultimately the most important concept in natural sciences. It is not surprising then that very basic and fundamental research achievements are related to symmetry. For instance, the Nobel Prize in Physics 1979 (Glashow, Salam, Weinberg) was received for a unified symmetry description of electromagnetic and weak interactions, while the Nobel Prize in Physics 2008 (Nambu, Kobayashi, Maskawa) was received for the discovery of the mechanism of spontaneous breaking of symmetry, including CP symmetry. Our journal is named *Symmetry* and it manifests its fundamental role in nature.

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