

Großes Physikalisches Kolloquium an der Universität zu Köln

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Dark Matter - connection between the structure of the universe and particle physics

Many observations in astrophysics show that so-called dark matter dominates the matter in the Universe. To clarify the yet unknown nature of dark matter is of very high interest for cosmology as well as for particle physics. The properties of dark matter are inconsistent with the standard model of particle physics. The spectrum of cosmic microwave anisotropy reveals a dominant role of particles without electromagnetic and strong interaction in the formation of structures in the Universe. Because relativistic particles cannot form structures in the Universe, there are no known particles left to explain the nature of dark matter. Dark matter is the strongest evidence for physics beyond the standard model. We will explain how the astrophysical observations necessarily lead to the conclusion of the existence of beyond the standard model physics and give an overview on the experimental and observational efforts to find out what kind of particles create dark matter.

