

Hunting dark matter in Reticulum II

Abstract

Abundant, and compelling, gravitational evidence indicates the necessity of Dark Matter (DM) within the presently favoured models of cosmology. However, the actual constituents of dark matter remain unknown and its identification remains one of the most challenging issues of modern physics. Profound theoretical motivations suggest the existence of particle DM, the most studied form being the Weakly Interacting Massive Particle (WIMP). WIMPs in DM halos can potentially undergo pair annihilation and/or decay, resulting in the production of detectable species. In particular, they can inject GeV-TeV electrons and positrons which interact with the ambient magnetic field and act as source of diffuse synchrotron radiation. The discovery of WIMP-induced radio emission would demonstrate the particle nature of DM and would be a significant step towards the solution of the DM mystery.