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GRANT THE SELDOM PROJECT OF NICOLA NERI HAS BEEN AWARDED AN ERC TO DISCOVER THE SECRETS OF ANTIMATTER

Nicola Neri, a researcher at the INFN section in Milan, has been awarded one of the prestigious grants of the European Research

Council (ERC) of almost 2 million euros with his SELDOM project, to be developed at the LHCb experiment at CERN's Large Hadron Collider, to investigate why our universe is made of matter rather than antimatter. The SELDOM project proposes a new experimental method to investigate the asymmetry between matter and antimatter, through the study of certain particular particles: heavy baryons. The distribution of the electrical charge of these particles has a spherical symmetry and their electric dipole moment - which measures the separation of electric charges of opposite sign - is predicted to be zero. One of the possible causes of the asymmetry between matter and antimatter in the universe could be linked to the not perfectly spherical shape of these particles, highlighted by the non-zero electric dipole moment. SELDOM is a competitive project at the international level: it is in fact part of an intense experimental research program of the electric dipole moment of the neutron, of the proton and of leptons, in progress worldwide, adding the new possibility of studying baryons containing heavy quarks, thanks to a new fixed target experiment, in which heavy baryons will be produced and then channelled into curved silicon and germanium crystals. This research could prove important because the eventual discovery of the electric dipole moment of a fundamental particle would represent clear evidence of physics beyond the Standard Model, i.e. of a new physics that goes beyond our current theories, and could tell us how it is possible that the universe exists, us included.