

SEARCHING FOR FUNDAMENTAL SYMMETRY VIOLATIONS WITH POLYATOMIC MOLECULES

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The fact that the universe is made entirely out of matter, and contains no free anti-matter, has no physical explanation. The unknown process that created matter in the universe must violate a number of fundamental symmetries, including those that forbid the existence of certain electromagnetic moments of fundamental particles – moments which are amplified by the large internal fields in polar molecules. We discuss spectroscopic and theoretical investigations into polyatomic molecules that uniquely combine multiple desirable features for precision measurement, such as high polarizability through symmetry-lowering mechanical motions, laser-coolable electronic structures, and exotic nuclei.