Faculty of Science and Technology
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Basic Laws in Elementary Particle Physics

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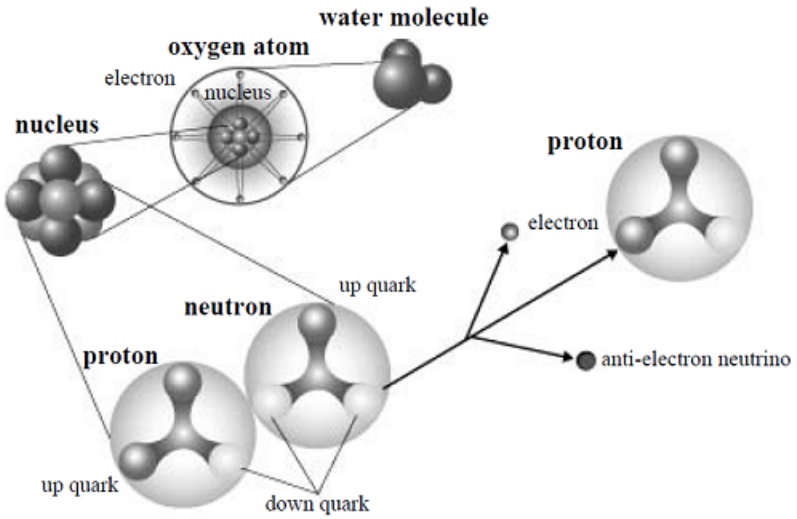

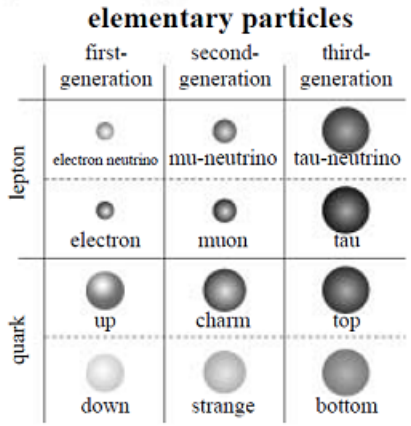

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Content: As shown in the left pannel, particle contents of matter and its interactions are well known at present almost in every respect. Such accumulated knowledge of particle interactions culminates in the so-called standard model of elementary particles. The model itself seems sufficient to describe nature observed so far.

However, the origin of the particle content is unclear in the standard model of elementary particles. The model has been built on quantum theory and relativity, whose restriction on the model building is not so strong as to pin down the standard model. Moreover, the quantum theory seems generic enough to describe observed data of physical phenomena, while theory of relativity is not inevitable from a theoretical point of view.

Our research on basic laws in elementary particle physics aims to reveal fundamental structures that select the standard model among other possibilities. The candidate structure is a new physical symmetry called supersymmetry, yet to be observed in nature. In particular, maximal supersymmetry may be sufficiently restrictive to fix the corresponding theory uniquely. A substructure of supersymmetry might lead to relativity under mild assumptions in the quantum theory.

Keywords : theory of elementary particles, supersymmetry

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