

# **$\Lambda$ - Toy Model of the Universe Constructed by Playing with Universal Constants recognized in Contemporary Physics**

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**Abstract.** In Physics we are using conventional units, e.g. nowadays the SI system. Some physicists, among them G. J. Stoney, M. Planck, and Ch. Kittel have introduced into physics of the last two centuries the so-called “Natural Units” determined by universal constants that govern in our universe and are recognized as fundamental and very important by the scientific community. Since several years I am trying to introduce especially into physics of the hypothetical Dark Energy a set of natural units determined by the three Einstein’s constants  $c$ – limitary velocity (especially of light),  $\kappa = \frac{8\pi G}{c^4}$  General Relativity gravitational constant and  $\Lambda$  - cosmological constant. Since long time in GR and Relativistic Cosmology there are already used some units determined by  $c$ ,  $\kappa$  and  $\Lambda$ ,: the  $\Lambda$  - force  $= \frac{1}{\kappa}$ ;  $\Lambda$  -pressure of the physical vacuum  $P_\Lambda = \frac{\Lambda}{\kappa}$ ;  $\Lambda$  - mass density  $\rho_\Lambda = \frac{\Lambda}{\kappa c^2}$  and  $\Lambda$  - energy density  $\rho_\Lambda c^2 = \frac{\Lambda}{\kappa}$ . In my paper (Kostro 2017) there was published the whole list of  $\Lambda$  -units. I call them  $\Lambda$  - units because they are determined, for the first time, also by the cosmological constant. Among them there are the Mega Units (perhaps Mega Quanta): of  $\Lambda$  - Mass  $M_\Lambda = \frac{1}{c^2 \kappa \Lambda^{1/2}}$  of  $\Lambda$  - Energy  $E_\Lambda = \frac{1}{\kappa \Lambda^{1/2}}$ ; the Mega Quantum of  $\Lambda$  - Action  $H_\Lambda = \frac{1}{c \kappa \Lambda}$  and also the Mega  $\Lambda$  - Charge  $Q_\Lambda = (H_\Lambda c)^{1/2} = \left(\frac{1}{\kappa \Lambda}\right)^{1/2}$ . Since some of  $\Lambda$ -units can be interpreted as de Broglie like  $\Lambda$ - period  $T_\Lambda = \frac{1}{c \Lambda^{1/2}}$ ,  $\Lambda$ - frequency  $\nu_\Lambda = c \Lambda^{1/2}$ ,  $\Lambda$  - energy  $E_\Lambda = H_\Lambda \nu_\Lambda$  and  $\Lambda$  - wave length  $\lambda_\Lambda = \frac{H_\Lambda}{M_\Lambda c}$  and because between the all universal constants there are correlations and interconnections we can ask the question whether in the Nature there are perhaps  $\Lambda$  - mega waves,  $\Lambda$  - mega fluctuations . Heisenberg like Mega uncertainty relations will be also introduced. It will be asked also the question whether the unification of the Relativistic Cosmology with QM has to be done rather in the Large Scale than in the Small Scale. It will be also indicated that the crucial date in the evolution of our Universe i.e. its expansion acceleration about the 9 billion years after the Big Bang, coincides with the lambda time  $t_\Lambda \sim 9$  billion years.