New results related to the  TGD view about coupling constant evolution are discussed. The results emerge from the discussion of the recent claim of Atyiah that fine structure constant could be understood purely mathematically.  The new view allows to understand the recently introduced TGD based construction  of scattering amplitudes based on the analog of micro-canonical ensemble as a cognitive representation for the much more complex construction of full scattering amplitudes using real numbers rather than p-adic number fields. This construction  utilizes  number theoretic discretization of space-time surface inducing that of \blockquote{world of classical worlds} (WCW) and makes possible adelization of quantum TGD.

The understanding of coupling constant evolution has been one of most longstanding problems of TGD and I have made several proposals during years.

Could number theoretical constraints fix the evolution? Adelization suffers from serious number theoretical problem  due to the fact that the action exponentials do not in general exist p-adically for given adele. The solution of the problem turned out to be trivial. The exponentials disappear from the  scattering amplitudes! Contrary to the first beliefs, adelization does not therefore seem to  determine coupling constant evolution.

 TGD view about cosmological constant turned out to be the solution of the problem.  The formulation of the twistor lift of K\"ahler action   led to a  rather  detailed view about the  interpretation of cosmological constant as an approximate parameterization of the dimensionally reduced 6-D K\"ahler action (or energy) allowing also to understand how it can decrease so fast as a function of p-adic length scale. In particular, a  dynamical mechanism  for the dimensional reduction of 6-D K\"ahler action giving rise to the induction of the twistor structure  and predicting this evolution emerges.

 In standard QFT view about coupling constant evolution  ultraviolet cutoff length serves as the evolution parameter. TGD is however free of infinities and there is no cutoff parameter. It turned out cosmological constant replaces this parameter and coupling constant evolution is induced by  that for cosmological constant from the condition that the twistor lift of the action is not affected by small enough modifications of the moduli of the induced twistor structure. The moduli space for them corresponds to rotation group $SO(3)$. This leads to explicit evolution equations for $\alpha_K$, which can be  studied numerically.

 The approach is also related to the view about coupling constant evolution based on the inclusions of hyper-finite factors of type II$_1$,  and  it is proposed that Galois group replaces discrete subgroup of $SU(2)$ leaving invariant the algebras of observables of the factors appearing in the inclusion.