Nuclear string models

1. String like objects dominate the physics in TGD Universe.
   (a) TGD is more stringy than string models although fundamental objects are 3-surfaces rather than strings.
   (b) The first reason is fractality. Second reason is that string world sheets emerge from Kähler-Dirac equation by requiring that em charge is well-defined for spinor modes.
   (c) This is achieved if spinor modes are restricted to space-time regions with 2-D CP_2 projection with vanishing classical W boson fields. In generic case the spinor modes are restricted to 2-D string world sheets but also entire space-time surface can have 4-D CP_2 projection in which case one has slicing by string world sheets. Cosmic strings might correspond to this situation.
   (d) The primordial cosmic decay to elementary particles and during radiation dominated phase Kähler magnetic flux tubes accompanying string world sheets replace cosmic strings.
   (e) One expects that Kähler magnetic flux tubes appear not not only in elementary particle length scales but in all length scales: nuclear, molecular, biological, astrophysical and cosmological length scales.
2. Nuclear string model makes following assumptions.
   (a) Nucleons (proton and neutron) combine to form string like structures. Nucleus would consists of this kind of folded strings. There is analogy with protein molecules which also form highly folded structures. Also now magnetic flux tubes as underlying structures are suggestive and the connection might be much deeper than one might expect.
   (b) Whether strings contain only neutrons or protons or both is an open question. The proposed model for dark nuclear strings as a realization of genetic code at dark nuclear physics level assumes that these strings consists of dark protons with non-standard value $h_{eff} = n \times h$ of Planck con- stant.
   (c) Nucleon space-time sheets are connected by color magnetic bonds carrying Kähler magnetic flux and therefore also Kähler magnetic flux since classical color field is proportional to the induced Kähler form.
   (d) The model should explain why certain nuclei have especially large binding energy and are thus especially stable. This occurs for magic proton and neutron numbers. Harmonic oscillator model for nuclei explains these numbers satisfactorily and one expects that the assumption about highly coiled nuclear strings justifies the assumption that mass density is constant for protons and neutrons in turn justifying the har- monic oscillator model.
3. A model for nuclear string.
   (a) The nuclei in the string must be bound to form a string by by some interaction. Color bonds between nucleon space-time sheets allow to achieve this.
   (b) The color bonds have quark quark and antiquark at their ends. One can assume vanishing of the total color charge of the bond so that it would form a meson like state but with a p-adic length scale longer than hadronic one. A good guess is M_{107} assignable to leptons. The corresponding p-adic mass scale is of order of MeV characterizing nuclear physics. Even longer p-adic length scale can be considered. A scaled down copy of hadron physics would be in question.
   (c) The flux tubes in question has quark and antiquark at its ends. They could have also different charges so that the charge of the flux tube could be Q= 0,1 or -1. Q=0 would give ordinary nuclei which consist of protons and neutrons. Q=± 1 predicts nuclei that have proton and neutron numbers differing from those deduced from mass number (A=N+Z) and charge (Z).
   (d) This kind of exotic nuclei could look like fermions but be actually bosons and biological some important fermionic ions might be actually bosons if they have charged color bonds and form Bose-Einstein condensates.

4. Indications for the existence exotic nuclei with charged color bonds.

   (a) The intensity of X ray radiation from Sun at Earth varies periodically since the distance from Sun is varying. It has been observed that nuclear decay rates vary also periodically. Shnoll has observed similar periodicity both in nuclear and chemical reaction rates.

   (b) If the ground state energies of exotic nuclei are in keV scale, these observations could be explained. Gamma rays would induce W boson emissions changing the em charge of two color bonds. For instance two neutral color bonds would develop charges +1 and -1. It is also possible that color bond with keV energy scale is excited. As a consequence the average nuclear decay and reactions rates change.