

The “Quantum Space Theory” (QST) could explain the LENR

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The QST theory elaborated in 1994 by F. Santandrea, now under revision, contains some topics concerning the LENR recently submitted and appreciated from LENR researchers, QST could giving an unifying point of view on the whole Physics.

For further detailed please refer to the following link QST updated topics:

<http://www.atlantedinumerielettere.it/energie2006/pdf/labor-ingl.pdf>

Ten years later the same basic ideas were independently approached by U. Abundo employing the tools offered by the J.Von Neumann’s Cellular Automata from a point of view focused on information traveling, please refer to the following link:

<http://fondazioneneumann.it/opussimbolicum/frameopus.htm>

The well known Widom-Larsen theory, basically focused on the cooperating behavior of the electrons in condensed matter (tuned with the theory of G. Preparata) may be regarded as a special case, under specific conditions, of what is predictable by the QST.

According with QST, it is naturally predictable the loss of identity of the electrons confined into condensed matter lattice, while the properties of space have priority and permit/control existence and behavior of electrons, so giving a natural coherence to the assumptions of Widom-Larsen.

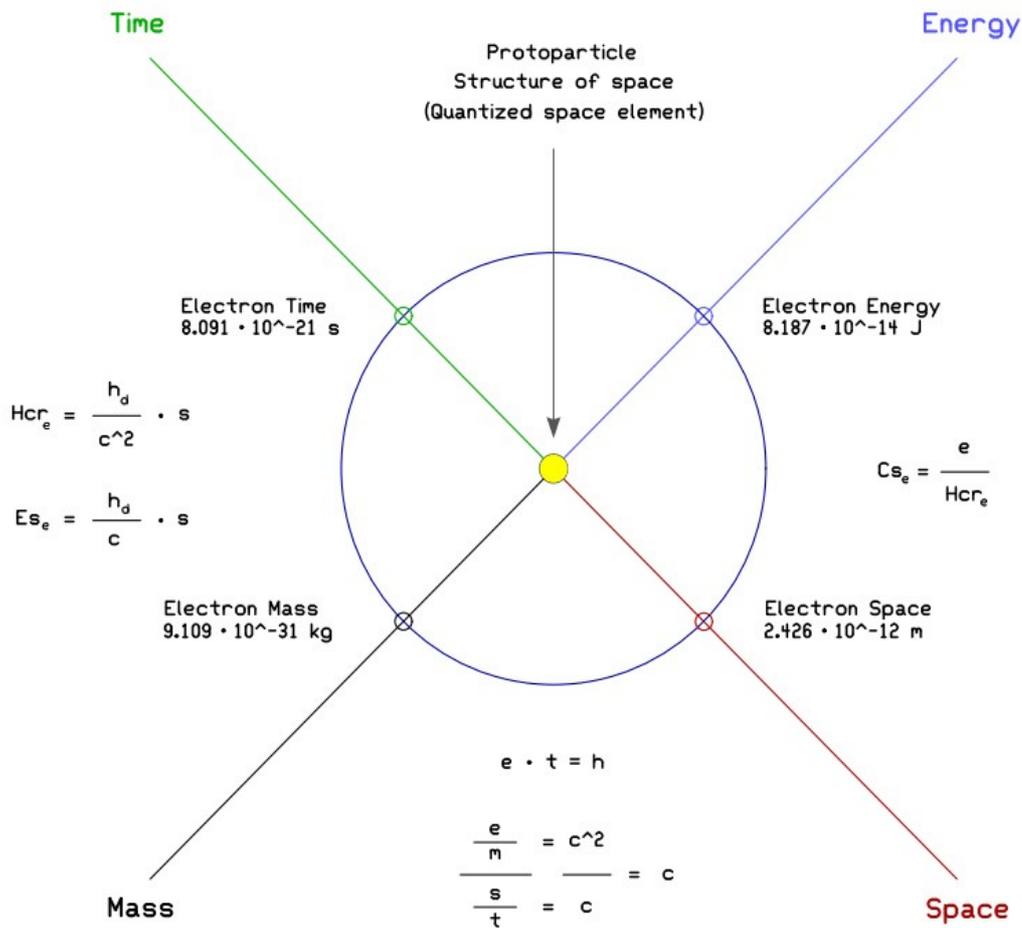
Into the present new approach to space and particles structure, the latter become just expression of stable resonance frequencies of space; the same electron, particles and generally condensed matter are “electromagnetic objects” constituted of standing waves into the space quantum found by TSQ.

This representation opens new insights to quasi-particles with non-discrete charge and anomalous energy emissions.

The synthesis represents Physics as space, its electromagnetic properties: electric permittivity, magnetic permeability, Lorentz force and the resonance phenomenon.

So the fundamental role of Space is to constitute the substrate or medium that permits the existence and behavior of particles (derived from electric and magnetic properties of space); on the other hand, such space properties are affected by the particles behavior in terms of generalized R,L,C values.

A new concept as “protoparticle“ may now generalize the coherence between space and particle.



$H = 6.626 \cdot 10^{-34} \text{ Js}$	Planck constant (Action space quantum)
$h_d = 6.626 \cdot 10^{-34} \text{ Js}^{-1}$	Distributed Planck constant (Reaction space quantum)
$c = 299792458 \text{ ms}^{-1}$	Speed of light in vacuum
$Es_e = 5.363 \cdot 10^{-54} \text{ J}$	Structure energy
$Hcr_e = 1.789 \cdot 10^{-62} \text{ Jsm}^{-1}$	Structure constant

The protoparticle model generalizes the meaning of particle and assigns to space the role to define (by resonance) the properties of particles and their mutual interactions and with electromagnetic fields.

Thus the particles are space regions in resonance, both obeying to self-generated Lorentz forces and sustained by the same.

The QST suggests itself as a basic generalization to re-build the concepts of individual space and particle.

The dynamic coherence between electric and magnetic field of the space defines a region where the space curvature (caused by the stationary perturbation) entraps by resonance the same electric perturbation, generating the electron (first resonance).

The second space resonance may be the nucleus proton and its symmetrical, and so on, from particles to atoms, molecules, matter, biological and cosmological entities, the quantified space and resonance play a basic role, forming structures and controlling stable behaviors.

Such a local equilibrium is responsible of the existence of the particles in their dual role particles and standing waves.

LENR energy

Electron Fusion / Annihilation

(Updated from Theory of Quantum Space - chapter IV)

Preface - Charge quantization depends on the properties of the space

Remember that the experimentation for search structure of electrons have proofing the absence of structure up to several orders of magnitude under the electron classical radius.

It is important to refer LENR to experimental work concerning, since 1980, the developing of ESD (Electron Singular Devices) by D. Averin, K.K. Likharev, T. Claeson.

The typical ESD device is consist of a junction conductor-insulating-conductor with thickness region insulating of tens nanometers order.

An electric voltage on such a device shows that the electric charges flow through the junction in a discrete manner, while the power consumption is continuous, like a water drop forming from a tap.

The water drop will detach when the gravity exceeds the tensioactivity, and the charge drop will self-sustain when its charge will be “built” in resonance with the properties of space, so flowing as discrete entities.

Thus, in vacuum space or insulating matter electron is a stable stationary wave with quantum charge; otherwise in condensed conductive matter electrons may behave as not-individual particles with continuous charge.

Where such a behavioral change happens?

Near interface between phases the absolute properties of vacuum space, insulating gas or matter become relative ones according with condensed matter and quantum properties of electron change itself into new behaviors.

LENR Energy from electron Fusion / Annihilation

Many scientists, during LENR - cold fusion experiments, observed an anomalous energy production by unknown cause.

An interesting hypothesis suggests such a production may be caused by electron fusion/annihilation.

In the previous part of QST was shown electron is the marking point between unconstrained wave and constrained one, i.e. between free traveling wave and quantum particle.

Cold fusion may be a process where an high current concentration permits electron fusion/annihilation.

If the electron corresponds to the resonance frequency of the space will be possible with electromagnetic stationary perturbation open electron and release its energy.

In analogy, the photoelectric effect proofs that an energy above a threshold can release a free electron from a charged metal.

In ALL cold fusion experiments there are high current concentrations, that are responsible, we suggest, of energy release in specific conditions.

We assert the matter (and electrons specially) may open and release its constituting energy from quantified space.

It is possible to imagine a self-structuring process to constrain energy in a compact form into a particle, allowed from quantum space.

On the other hand, the same rules permit suitable electromagnetic perturbations and interactions by other particles to break the equilibrium end extract the energy in terms of annihilation of electrons or protons, or promote nuclear fusion/fissions.

These cases are referred to second part of QST, where a electric current is associated to single particles.

Therefore summarizing, on the surface of the condensed matter the space properties may change the rules to which rising electrons (quasi-electrons) must obey; especially when lattice have zone in surface with dimensional irregularities compatible with electron Compton wavelength*, in this area there are transitions from gas degenerate / waves to particles, when this surface is plasma area and stressed with temperature and pressure rising electrons are constrained to annihilate and release energy.

* Electron Compton wavelength = $2,4263 \cdot 10^{-12}$ m

This probably happens in Rossi's nickel powders, Celani's Costantana wires and in Abundo's tungsten powders.

Hypothetically such an electron energy may be directly focused into an electric current, avoiding thermodynamic cycles.