

Light and Matter - Two Sides of the Same Coin

by *Daniele Funaro*

The book proposes in a synthetic and provocative way the main ideas that led the author to outline a possible model of the universe in which we live. The theory brings together the main phenomenological aspects in an alternative vision to the purely quantum one, judged by the author himself to be outside of “common sense”. In order not to burden the discussion, the technical steps are not exposed, but they are partly developed in other academic publications (books or scientific articles by the same author).

At the basis of the entire construction is a revision of the constitutive equations of electrodynamics, which, by eliminating some ambiguities of the current version, lead us to better formalize the definition of “photon”, paving the way for a description of quantum phenomena from a classical point of view. While not taking anything away from the world of applications, this interpretation allows us to understand the conformation of atoms and therefore provides a more detailed description of the structure of matter. In the analysis of practical cases, the model is not inconsistent with the quantum approach, but intends to reveal what lies at its basis, sinking the roots in a deterministic context. A completely different matter, however, regarding quantum philosophy which, according to the author, has now lost any reasonable connection with the real world.

The most innovative hypothesis of the discussion is the chance of defining the concept of *pseudo-charge*, i.e. the presence of electric charge density without necessarily having canonical charges (electrons or protons, for example). Initially, this possibility was created to justify some mathematical passages, deemed necessary to fix some inaccuracies in the classical theory of electromagnetism. Subsequently, the idea evolved to admit that the universe consisted mainly of a background, described through equations that combine fluid dynamics and electromagnetism. The approach is similar to that which regulates the dynamics of *plasmas*, but with the difference that there is no a priori need for the notion of (massive and charged) elementary particle. This difference may be considered subtle and inessential by some. However, it constitutes the real revolution, without any foundation of classical physics being called into question.

Together with the pseudo-charge, through acceptable physical considerations, the concept of *pseudo-mass* can be also defined. It follows that we can think of an embryo model of the universe exclusively made up of a continuously evolving “electromagnetic fluid”, where almost all the laws known to us apply, but where the presence of real matter is not pre-established. This is added later. In fact, fluids can create highly stable structures known as *vortex rings*. At least for the case of the electron, it can be verified quantitatively that this particle is very well represented by a small donut composed of electromagnetic fluid. In this way, in a well-defined region of space, portions of pseudo-charge and pseudo-mass remain stably imprisoned in a single unit of charge showing mass (the rest mass of the electron). The same happens for the antiparticle of the electron: the positron. Electron and positron can annihilate and decay into photons. In the context of the “new” electrodynamics the whole phenomenon can be fully described while remaining within the established laws. The particles arise from the background and can return to the background. The conversion of matter into energy and vice versa takes on a clear meaning here.

Construction can continue at this point, even if there are not rigorous mathematical details at the moment. You work first on protons and nuclei to subsequently form atoms and molecules. The particles of matter constitute a scaffolding within which an agitated electromagnetic ocean moves, connecting the various pieces and transferring information at speeds comparable to that of light. In turn, the evolution of the substrate is strongly influenced by the presence of particles, so much so that the whole environment organizes itself into shells which, growing in size, enclose increasingly complex structures and resonate at various frequencies. The mathematical feasibility of this approach can be verified in countless contexts. Matter is therefore not made up only of “matter” but is the result of the union of massive elements and the electromagnetic fluid that keeps them aggregated. The evolutionary modality of this fluid contributes to uniquely characterizing objects. It is natural on these hypotheses to establish how a simple molecule, or a more complex structure, can absorb or emit light quanta, a process explained very crudely by current theories in physical chemistry. In the new perspective, this trivially happens because everything is electromagnetic from the very beginning. Consequently, if an object is divided into parts, the fluid reorganizes itself differently, confirming the hypothesis that unity is not necessarily the sum of its components. Chemical reactions are the most basic manifestation of this *modus operandi*.

These are in general the guidelines set out in the book, to which various other considerations, including epistemological ones, are added. A universe composed exclusively of electromagnetic fields and a few unifying rules that manage their dynamics now appears possible. A universe practically composed of a single “block” of light, where the particles are not added singularities, but are expressions of it and interconnect through it. The interest is no longer concentrated on the single particles and their interaction at distance, but on the enormous cradle that contains them. What we call matter no longer has boundaries and objects are the inseparable union of massive elementary particles and the highly energetic fluid that surrounds them. A fluid that hides unimaginable powers, ready to be exploited through a better knowledge of the geometric aspects.

Finally, we can ask ourselves how this interpretation can influence the evolution of living cells or the relationships between human beings and the environment. The book also gives space to these aspects. Of course, the topic is extremely extensive but it is enough to have proposed the fundamental ideas. Ultimately, the general setup is simple, and was certainly under discussion a century ago, before the quantum revolution completely watered down the scenario. The reader ready to accept this view will see many of the explanations proposed by modern physics under a different light (ironically, the universe itself turns out to be composed only of *light*). This essay is dedicated to those of all ages and levels of preparation who, with a revolutionary spirit, would like to try the possibility of opening new horizons, without settling on theories that have already been tested and which lead nowhere.