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André Michaud

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*“A photon is a shimmering butterfly
escaping from the chrysalis of the atom”*

Pierre Rousseau, 1941

ELECTROMAGNETIC MECHANICS OF ELEMENTARY PARTICLES

2nd Edition

Preface to the Second Edition

Through the ages, the various aspects of the world in which we live were progressively understood as our knowledge base increased. The submicroscopic level of physical reality was particularly difficult to explore, due to the inherent difficulty in studying the nature and interactions of the vanishingly small particles that we know every material object observable in our macroscopic world is built from.

Deep understanding has been achieved regarding many aspects of these particles and their interactions, which resulted in successful and useful applications at our macroscopic level grounded on this understanding. Aspects at first glance unrelated of this understanding, such as electromagnetism and relativistic mechanics that underlie much of our modern technology are even so closely related that Maxwell's equations and relativistic mechanics equations can be derived from each other, as will be shown in Chapter 5.

Other aspects seem less closely integrated, but there is no doubt either that Quantum Electrodynamics (QED) and Quantum Mechanics (QM), for example, belong to the proven set, the first because it provides exact values for electric interaction between elementary charged particles, and the second because it provides the proper shapes of the resonance volumes that electrons can occupy in atoms' least action orbitals.

There remains also no more doubt that elementary charged particle are electromagnetic in nature and are closely related to kinetic energy. Their electric and magnetic characteristics have been associated to "fields representations" since Gauss introduced the concept in the 19th's century, that we use like "metaphorical maps" to represent this real "physically existing submicroscopic country" that elusively remains out of our direct observation reach.

Although Maxwell's equations define both electric and magnetic fields as cyclically inducing each other, it has not proved possible yet to coherently represent this cyclic mutual induction within these localized elementary particles that we know to be "electro-magnetic" in nature, in the restricted frame of the 4-dimensional space geometry.

The last chapter of this second edition puts in perspective the manner in which a new trispatial geometry of space presented in July of 2000 at Congress-2000 at St Petersburg allows establishing a mechanics of elementary electromagnetic particles that integrates all conversion processes that are possible between kinetic

energy, electromagnetic energy and mass at the submicroscopic level, as well as the sequence of trispatial LC equations that coherently represents this cyclic inner mutual induction of both electric and magnetic aspects of kinetic energy within elementary particles.

This new geometry also draws attention to the fact that kinetic energy is adiabatically and permanently induced axially in electrons when captive within atomic structure, which is an energy state that the Hamiltonian, basic to quantum physics, and by the same token, the Lagrangian, are unable to account for when these electrons are translationally immobilized into one of these various least action electromagnetic equilibrium states, which correspond to the resonance states described by Quantum Mechanics. See Chapter 3 on this particular issue.

New awareness of the mass variation effect due to the presence of this adiabatically stabilized induced kinetic energy in atomic and nuclear structures as a function of the local intensity of the gravitational gradient also sheds an entirely new light on gravitation, because it can be demonstrated that these least action electromagnetic equilibrium states in atomic and nuclear structures that determine these energy levels also determine the local intensity of the gravitational gradient on top of determining the orbital resonance states revealed by Quantum Mechanics, thus unifying QM with gravitation.

This book explores the foundation of an electromagnetic mechanics of interactions between elementary particles that remains to be completed at the submicroscopic level and whose laws also apply by structure to both the macroscopic and the astronomical levels.

June 2017

André Michaud

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Availability

Most aspects of the electromagnetic mechanics of elementary particles developed in the frame of the tri-spatial geometry have been made available in a series of separate articles freely available.

Some aspects however could not coherently be integrated into such a series of separate papers, but are completely integrated into the complete and final monograph that describes the 3-spaces model and that allows reconciling electromagnetism with Quantum Mechanics, Relativistic Mechanics and gravitation. Published by **Scholars' Press**.

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Electromagnetic Mechanics of Elementary Particles

Description of a spacetime geometry that allows representing the mutual induction of electric energy and magnetic energy within elementary particles in motion in conformity with Maxwell's equations. This new geometry draws attention to the fact that adiabatic kinetic energy is continuously induced in all elementary particles captive within atomic structures, which is linked to an atomic axial mass variation effect related to the local intensity of the gravitational gradient, which sheds an entirely new light on gravitation, since it can be demonstrated that these least action electromagnetic equilibrium states determine the local intensity of the gravitational gradient on top of determining the orbital resonance states revealed by Quantum Mechanics. This book explores the foundations of an electromagnetic mechanics of elementary particles whose laws apply by structure to the sub-microscopic level, the macroscopic level and the astronomical level, thus allowing the reconciliation of electromagnetism, Quantum Mechanics, Relativistic Mechanics and gravitation.



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