The new Copenhagen Interpretation of Quantum Theory (2012)

Molecular Physics without Atoms: Holistic Field Branching, Collapse, and Einstein´s Relativity Principle

By Mario Wingert

The Quantum Enigma: How can something divide itself and nevertheless remain a whole one?
Answer: There must happen a holistic division (and fusion) process of fields.

The Right Question

Richard Feynman once stated that the double-slit experiment contains the only one mystery, symptomatic for all difficulties in quantum physics. But he also believed that it is impossible to understand how a light quantum (or electron, or atom, even an abstract particle) acts during the passage of the double-slit. This of course is the big question - but it is rather a question for the right physical concept of the shown properties of Nature, and wether we have the right physical problem understanding at all. If we are bold enough to face the truth, we must say no - we have not.

Nevertheless is it a simple topological problem and easy to visualize: It plays no role for the fundamental physical conflict at the double-slit or in partial reflection and polarization experiments, wether the entity in question is imagined as tiny „hard billard ball" with the atomic property of indivisibility (classical mechanical body picture plus atomos hypothesis), or as tiny „field ball" which moves through the empty space, also coupled with the atomic property of indivisibility (this was Einstein's quantum mechanical, but provisional picture of the light quantum). That makes no difference in principle for the understanding of the topological contradiction between the assumed physical property of indivisibility, and the experimentally demanded physical property of divisibility at the double-slit or in partial reflection and polarization processes.

What is questioned by these experiments is the atomos hypothesis, the indivisibility assumption, as a physical property.

The 100-years-blockade of the physicist's thinking to find an adequate physical model for the shown (quantum) properties of Nature goes back to Einstein's quantum hypothesis of light in 1905, but he is not the cause for the long lasting stagnation. Einstein had postulated an hitherto unknown structure of the electromagnetic field which could not be homogen and continuous as Maxwell had thought, but should have some kind of grainy structure, consisting of defined amounts of energy. This field structure should cause a new kind of interaction with matter, explorable by emission and absorption events. According to Planck's ad hoc formula these interactions should consist of the emission or absorption of discrete quanta of field energy by matter structures. To modelize these interactions and the properties of the yet unknown field structure Einstein designed a model in analogy to material gases, in which he used the body term of mechanics as a raw metaphor and „heuristic approach" to reflect the energetical wholeness of emitted and local acting light quanta, and a non-continuous structure of the free electromagnetic field. He imagined this property explicitly *provisional* as a particle-like concentrated energy package which moves through „the space" with the speed of light.

But was Einstein's comparisation of the wholeness of an acting field structure unit (energy quantum) with the wholeness of a mechanical body – which implies the atomos assumption, even indivisibility - really appropriate? He knews that there was a great bit of physical truth in his construction, but he also knews how everybody else that his *atomic & mechanical methaphor* stands in a deep contradiction to the double-slit experiment and the interference condition - which demands a physical concept that could model the *simultaneous passage* of both slits. Precisely for this purpose the wave model was originally invented by Young & Fresnel, which becomes eventually the main model of Maxwell´s continuous electromagnetic field theory. And that model was now questionable because it could not explain or modelize the postulated field structure, local absorption events, and the non-dilution of field energy by time or distance. And the body term of mechanics was questionable since 1801, because it could not explain the simultaneous passage of Young's double-slit experiment.

This was the situation in 1905, all about the deficits of the hitherto only one known field theory. Einstein himself was fully aware of the provisional chararacter and „rawness" of his field-particle picture, but despite a lifelong search for a better solution he was never capable to find a new physical concept or principle to resolve the contradiction between the wholeness of an acting energy quantum, physically (mis)interpreted as indivisibility until today, and the obvious divisibility of fields at the double-slit, interpreted physically with the now only half-true *wave model* of Maxwell. The real physical meaning behind Einstein's mechanical metaphor for the wholeness of an local acting light quantum was the intention to find an adequate expression or model that could fulfill the conservation of energy: The *whole* emitted light energy quantum must come to effect in an local absorption event, which was the establishment of an energetical symmetry condition for both sides of interacting matter structures, and for the structure of the free electromagnetic field itself. Einsteins leaves us this wave/quantum-as-a-particle paradox as a challenge - and possibility - to think completly new about the foundation of physics, to develop new physical concepts on the basis of experiments, and to understand Nature and reality without contradictions. This is the goal of science, at least in my view, too. And this is not so difficult as it seems, if we look unprejudiced at the double-slit experiment. It prompts the very question: **How can something divide itself and nevertheless remain a whole one?** This question can only be answered with a brandnew physical concept.

The only one Option: A holistic Division Process (The Branching Principle)

Double-slit, partial reflexion and polarization experiments reveal the only one option to understand Nature and reality without contradictions: These experiments are showing unambiguously that there must happen a divison process - but it can`t be a mechanical division, a splitting. Thus the only one option is a *non-mechanical* and therefore *holistic division or branching process*. We are forced to this conclusion because of the interference condition, which is also known as „superposition postulate" in quantum mechanics. It is experimentally well founded and demands the simultaneous passage of both slits, or ways. These experiments are showing further that the emitted light quantum, or matter structure, comes to effect - if it comes to effect - ever point-like local as a *whole* light quantum, electron, atom, or molecule. This is the absorption condition. It tells us that in effective events the conservation of energy is fulfilled. But that condition shows us something more which has not been recognized until today: The absorption condition fulfills also Einstein's definition of simultaneity, which is defined by the *simultaneous incident of two light rays at the absorption point*, the point of the „observer" in Einstein's Special Relativity! These two light rays are now our two branches, which have to be reunited to enable local and holistic absorption events!

Now it becomes clear - if we accept the simultaneous passage of the double-slit or both ways in polarization and interferometer experiments as an important property of reality and a basic condition for our *physical* model building - that the interference condition (or superposition postulate) covers a real physical meaning: It is a new *physical* principle - the *branching principle*. It says that holistic division or branching is a real physical process in Nature, suitable illustrated by a branching laser light ray, or by a cell division and space-like branching process of the Maxwell sphere, or by branching of the 4D-Minkowski „space-time". Then we can discover the reversal of this process in the absorption event: A point-like reunification of the two field branches, a structure fusion. This gives us an answer to the old question what the so-called time-symmetric version of the Maxwell equations could physically mean. And it displays creation and anhilation processes, as demanded by relativistic field theories. The branching process is not only real for light quanta, it refers to all kinds of field structures of arbitrary complexity, also to atoms or molecules. Thus the key experiments of physics *disprove* the atomos and elementary particle hypothesis (atomos: the indivisible). So we have to conclude:

1 The atomic assumption of the constitution of Nature is wrong

2 The body term of mechanics - and the term „elementary (indivisible) particle" - has no physical and constitutional meaning
(Not only in quantum physics, but in general in Nature. A holistic division process is unknown on principle in mechanics, and there is no „ontological contur" which separates matter from fields)

3 The interpretation of the constant c as velocity in the sense of mechanics must be wrong

4 Particles or field-particle-like entities are ruled out by the interference condition
(Quantum mechanical interpretation, Ensemble interpretation, Bohm- de Broglie theory, Quantum Field Theory Standard Model interpreted with field particles, or empty „modes")

5 Interpretations based on the assumption of even more smaller constituents then particles, like strings, are ruled out by the interference condition
(The sophisticated mathematics, despite of branching models (!), has no physical equivalent as long as the interference condition in the double-slit experiment will not be explained and respected as the judge of physical claims. So what happens with a „string" at the double-slit?)

6 Branching interpretations without reunification are not capable to reflect the energetical wholeness of single, local absorption events (e.g. the conservation of energy)
(Thus branching interpretations without a collapse in the sense of a local reunification of the two or more branches are ruled out by experiments with single light quanta, electrons, or atoms, like Everett`s interpretation, multiversum, parallel or many worlds, and decoherence theories)

The Reversal Process: Field Structure Fusion (Bose-Einstein-Condensation)

The reversal process (called R like reduction by Roger Penrose, process 1 by John von Neumann) then explains the local collapse of the so-called wave or state function as a structure fusion process of a branched field in the sense of the Bose-Einstein-condensation, e.g. a lost of field structure, and reveals a global and local symmetry condition. This is not a time reversal and not a reversal of a mechanical movement, but a reversal of a non-mechanical structure generating process, in which the branched field structure (and the quantum of energy) gets lost. More exactly: At one side of the interacting parts (electromagnetic field) the particular branched structure (quantum of „light") gets lost, but at the other side of the symmetry, in the matter structure, a new branching process will be induced locally, a change of that matter structure. This is energy transfer, and mass generation.

The global symmetry condition is known as coherence - and means physically exactly now the connectedness of branched rays or cells of a field, which are separated topologically like a left and right hand, but still a whole one, now with enantiomorphic properties (en-antio-morph: an asymmetric whole, a symmetry distortion, in itself anti or mirror symmetrical structured). In this coherent branched state the branches or cells cannot interact with each other directly (this explains Pauli's exclusion principle ontologically and physically, and the stability of matter or branched fields in general). The anti or mirror symmetry must also hold for non-local (global) expanding branched fields, until an effective local absorption event takes place. We do circumscribe this fact with the phrases: capability to produce interference, or superposition principle (now: branching principle), independend of time or distance scales. The local symmetry condition we have recognized in the absorption event, in which both branches will be reunited, forced by the conservation of energy.

Collapse: The double local Einstein Symmetry Condition

Hence we can conclude: If the division process at the double-slit is really a field structuring, enantiomorphic branching process, then both branches must come together locally in absorption events to be reunited - to fulfill the conservation of energy, to enable the transformation of the *whole* emitted energy. And this is exactly Einstein's definition of simultaneity in Special Relativity (A. Einstein: „Über die spezielle und allgemeine Relativitätstheorie". 1916, § 8 „Über den Zeitbegriff in der Physik"), *and* his definition of an acting light quantum (light quantum hypothesis, 1905), and reveals now the structure of the electromagnetic field that Einstein had searched for all his life in vain! So we can say that the double local Einstein symmetry condition „causes" R; or better: symmetry *and* energy con-

servation is the precondition for effective local absorption events - for „pointlike“ (local) quantum effects, even for every kind of *effective* physical interactions of field entities, which cause changes of the physical structure on both sides - radiation field and condensed matter field. To be clear: With effective events or interactions I'm meaning here only 100% absorption events, even the absorption of the whole emitted quantum of energy. Interactions with polarizers, glass sheets or double-slits are not effective interactions in this sense, they are *reversible* branching processes, and therefore they touch the matter structure, but do not real change it sustainable. That follows from the definition of the acting quantum, and the experiments. Thus they don't cause a „collapse of the wave function“, or now: of a branched field state, and will be dubbed non-effective (adiabatic) interactions.

By the way: In the old Copenhagen interpretation the term „collapse“ does not mean really an physical explanation. It is only a non-physical postulate with an particular „epistemological“ claim, referring to the unexplainable selection of *only one* of the two (or more) partial „wave amplitudes“ (branches), to be capable to leave the wave equation procedure with a physically, experimentally and logically not justified jump into good old mechanics - and the atomic worldview. A reunification of all branches as precondition for local absorption events is unknown until today, which makes decoherence or multiversum interpretations so attractive for many researchers. They take at least the interference condition physically serious, which is honorable, but come then into philosophical trouble, without reunification of the branches.

Branching yes, but no parallel Universes

Thus the second branch or wave-part is not „lost in space“, or „dislocated“, an „empty mode“, or physically meaningless (as it is claimed more or less directly in the old Copenhagen interpretation, in decoherence interpretations, and in some field theories), and therefore it is physically senseless to postulate branching „universes“, „doubling of the whole world including the observer“, „parallel universes“ or „many worlds“ in the sense as these terms are used today - without the acceptance of the local collaps event: Process 1 or „Reduction“ is real and means now field structure changing by effective energy transformation, which is non-reversible - in opposition to the pure branching process of the field asymmetry at the double slit, a polarizer, or a half-silvered mirror, which is a non-effective, a non-energy-transforming event, and therefore reversible. But we can say that Hugh Everett was the first one who had assumed behind the model of the wave equation at the double-slit some kind of a physical real branching process. The interpretation of his considerations as parallel worlds with „doubling conscious observers“ came later, probably from Bryce DeWitt and David Deutsch.

Measurement Problem

The term measurement is a little bit euphemistic then, because it makes no distinction between non-effective (reversible, adiabatic) and effective (non-reversible, energy transferring) field structure changing events (at least between 1927 and 1990). In reality we have to do here with *qualitative* structure changes, caused by physical interactions, but not with quantitative-relational measurements (the use of scales in the classical sense) - but this is not so clear as it should be. Thus the „human observer“ is not needed to explain or modelize effective physical interactions, or branching and fusion processes. In the old Copenhagen interpretation the „conscious observer“ was only introduced by Bohr because of two functions. The first was a physical one: It is not possible anymore in quantum physics to make statements about *effective* events when - or if - they happen elsewhere outside of our knowledge area or range of devices - that means, when the detection apparatus is not involved (Schroedinger's cat). That is because effective events are ever local and individual (so we could say „solipsistic“), thus we cannot get a *direct* information of an absorption event in other structures (only indirectly, p.e. by emitted light as secondary effect). If we are able to secure that we can detect *any* possible effective event in an experimental setting by devices or induced secondary physical effects, we are speaking of „normierung“ (setting the value of the probability of an absorption event equal one). The second function was an epistemological one, at least in Bohr's view: An human observer is needed by Bohr to justify the axiomatic introduction of traditional terms and physical concepts (the so-called classical terms) like object, body, particle, atom, wave, space, time, velocity, angular momentum etc., because they cannot be satisfied by experimental evidences - they are not deriveable by the shown properties of Nature which became known as quantum physics. The best examples for this are now the *body term of mechanics* and the *atomos assumption*, which are physically ruled out by the interference condition (the simultaneous passage of the double-slit). That's why Bohr and Heisenberg had to declare that such „things“ do not really exist - but the use

of these terms should nevertheless be allowed furthermore (although with care and restrictions) as „useful tools" for „physical" descriptions. This was no more than a declaration of the incapability of the human mind to grasp the real point of the problem: the true constitution of Nature, indicated by their „strange" quantum properties (branching, holistic division, non-mechanic, non-atomic). And this is the junction where you as a physicist have to decide between the original way of science (searching for new physical models and an true understanding of Nature and reality, looking with new eyes at the experiment) and Bohr's desperate attempts to reunite quantum physics with mechanics, only to rescue the particle picture and the atomos hypothesis, at least in the - for this purpose fresh invented - „macroscopic realm", the „every day world".

Constant c is neither Speed, nor Change of Position

The constant known as „c" get a new physical meaning now, it is no speed or velocity in the sense of mechanics anymore, no „change of position" of a mechanical moving field distortion, or of a particle-like „field-ball". This conclusion is forced by the topological and energetical symmetry of both branches in the absorption event, the double Einstein symmetry condition. It is a statement about simultaneity: Distance and time scales play no role for an absorption event, it happens instantan. Hence we have to deal now with a „new" kind of kinematics and dynamics of a global field entity, which is not wave-like as function of time as Maxwell had thought, but a real physical process like bifurcation, branching, or cell division of fields - in a timeless universe. Time and scales come into physics as consequences of such branching and fusion field structure changes, and are relational: For comparisation we take (and assume) normally stable periodic processes, and invariant scales of free choice. But a physical interaction causes a branching process - and the branching process is showing a period doubling: The cycle between invariant states is doubling (*relative* to an reference system, which seems to be invariant, non-influenced, or unchanged), the „time unit" is stretching, and scales are halved by holistic branching and division processes (length scales are shortening). Or vice versa, in the case of a fusion process. Hence we have to think new about kinematics, special relativity, renormalization and mathematical bifurcations, see also Mitchell Feigenbaum's theory of universality. On this way it seems to be possible to derive a profound ontological and physical model of quantization from the polarization process of fields (= holistic, enantiomorphic division & branched field states). We are then capable to design new models of matter and electromagnetic fields without atoms and atomic assumptions. How is that possible?

Paradigm Change: Unification of Science by a new, non-atomistic Worldview

To understand the impact of the field branching properties of quantum physics for macrophysics and the whole scientific enterprise, we should take a closer look at Avogadro's original hypothesis of 1811 - at the time when physical chemistry was born: It's issue was the experimental failure of Dalton's atom concept. Avogadro recognized - experimentally well founded - that Dalton's atoms must divide themselves during chemical reactions! Thus, he designed a new chemical „atom", which was now capable of dividing itself, and named it *constituent molecule*. In order to „explain" this divisibility, he assumed the existence of a pre-composition consisting of „elementary molecules" – which Cannizzaro first equalized with Dalton's atoms in 1860, after 50 years of silence. Since then we have a *mechanical picture - and model - for the division process of molecules*.

Today, however, physicists and chemists alike seem to be ignorant of the fact that the word atom did not appear in Avogadro's hypothesis at all (only one times in an - however incorrect - German translation). Avogadro had spoken exclusively of *molecular division and fusion processes*, of a chemistry without atoms! Just on this basis he founded his hypothesis that equal volumes of different gases contain the same number of constituent molecules, what allows a relational determination of the masses of the elementary molecules. Moreover, Avogadro seems to have assumed a general property of Nature, the capability for division processes even in macromolecules. He could not know in 1811 that there are indeed such processes in Nature, called *cell division* - they were first discovered in 1838, in living structures. So he could not operate with such a non-mechanical division model. Since Cannizzaro, we regard Dalton's atom hypothesis (the *philosophical principle* of indivisibility) and Avogadro's molecule hypothesis (the experimentally well founded *physical principle* of divisibility) to be compatible. But this is only true for the *assumption* of a mechanical division, in the mechanical worldview, where it appears as splitting & separation into two *independent* entities - but not for holistic division processes like cell division or branching: The two branches are separated but still connected, still beeing a whole one - but now with chirality or even enantiomorphic properties!

But today, faced by undisputed quantum physical experiments with single light quanta, electrons, atoms, and molecules - an universal, extensive proof of the interference condition and local absorption events in the interference pattern, carried out over 50 years - we have to conclude that atoms indeed perform a non-mechanical, *holistic division* and *fusion process*. This resolves the interpretation problem of quantum physics. The existence of the interference condition, the simultaneous passage of both slits, is now practically proved and theoretically accepted also for single entities, but not yet understood. Obviously, the cause was the extraordinary strong atomic assumption. But the mentioned experimental evidence is much stronger - and falsifies the atomos hypothesis. So we are forced to recognize - and to introduce - such non-mechanical, holistic division or even branching processes also to explain chemical reactions and the nature of chemical bonding, and thereby to renouncing the atom concept in chemistry as well.

Avogadro's original hypothesis shows that this is indeed possible. Contrary to the mechanical worldview it would mean that the double nature of the molecule is not caused by an assumed pre-composition, but will be first generated by a holistic division process of an „one-atomic" or even homogenous molecule. Thus, Avogadro's elementary molecules or Dalton's atoms are not the primary components of a composed molecule, but the secondary product of a holistic division or branching process! Figuratively speaking, one could also say that an atom cell-divides itself to generate a molecule - only that even then the term *atom* loses its original meaning, *the indivisible*. The physical constitution of gases then must be cellular, not atomic (like the structure of the electromagnetic field). So when giving up the physically senseless atom term and following Avogadro's original hypothesis, we freely and easily reach a molecular physics without atoms, which is fully consistent with the chemical experiments. Hence we can say: Democrit's atom hypothesis is dead, but Avogadro's molecule hypothesis survives!

In chemistry, of course, this cell division concept is not yet proved - even not yet thought by any researcher, neighter in physics, nor in chemistry. But it could be proved, with new molecule spectroscopy technologies. And it would be supported by Mulliken's molecule orbital and transmutation theory, an well accepted quantum theoretical approach for chemical bonding. If we could make a femto-second slow-motion movie of a molecular cell division process, we would have direct visual evidence and experimental proof. Then the atomos hypothesis would definitely be falsified - not only in physics, but also in chemistry.

The result of the resolution of the quantum enigma is even an allround scientific paradigm change, that refers not only to the so-called sub-microscopic world, but also to the macroscopic world. Now we can recognize the same physical principle of the true constitution of Nature everywhere – in quantum physics, physical chemistry, and biology: Branched structures, generated by holistic division processes. The new branching or holistic division principle unites physics, chemistry, and biology on the basis of a common physical structure concept, of enantiomorphic branched fields, gives a connection to nonlinear complex dynamics, and forms a new basis for the constitution of Nature and it's real physical understanding - and of old and new quantum technologies. And it reveals the secret of the thinking mind, perception, and the cognitive nature of language.

New Experiments, which falsify the Atom Hypothesis (The Indivisibility Assumption):

„Splitting the Unsplittable"
June 2012 - Physicists of the University Bonn, Germany, *„have just shown how a single atom can be split into its two halves, pulled apart and put back together again. While the word „atom" literally means „indivisible," the laws of quantum mechanics allow dividing atoms - similarly to light rays - and reuniting them..."*
Link: Splitting the Unsplittable
Paper: Proceedings of the National Academy of Sciences of the United States of America (PNAS)
Comment by Mario Wingert:
Of course theoretically not „new" for a quantum physicist, for it is what the wave or state function covers already since 1927 - but as a non-physical probability function or „mathematical tool for predictions", without any physical explanation or a claimed background in reality. But now again a process proved to be happen in reality, with single „atoms". That makes the difference. By the way, the first experiment of this kind after Stern-Gerlach in 1922/23 was that of Mlynek & Carnal 1991; an „atom"

interferometer on the basis of the double-slit experiment. Modern experimenters are using laser beams to replace diffraction gratings. The „splitting" experiment of Bonn is using one laser for cooling down the matter structure to a Einstein-Bose state with mimimal internal structure, and a second laser to induce the division process of the „atom". So it should become clear now s l o w l y that the old Copenhagen interpretation of the non-physical nature of this process has to be abandoned.

If you are not sure about what the difference is to the quantum mechanical interpretation of the „behavior" of single atoms, electrons or photons at the double-slit and equivalent situations, read again Richard Feynman's treatment of this situation as a „logical tightrope act" in QED (or in my book „Quantum Top Secret. The Solution of the Quantum Enigma"), or take a look again at your standard quantum mechanics textbooks: The official quantum mechanical interpretation is that in the double-slit experiment and equivalent situations „particles" like atoms, electrons and photons passes through *one slit or one way only* - but only if a „measurement" is made. That means, if an absorption event and its registration takes place. Offen (mis)interpreted as „which-way" experiments. But this has to be taken as an unexplainable mystery and „unsolvable on principle" in the quantum mechanical interpretation by Niels Bohr and his fellows, because the interference condition calls for an counterwise explanation: the simultaneous passage of the double-slit. That is even the wave/quantum-as-a-particle paradox. That's why a quantum mechanic needs the „wave function" (or DeBroglie's matter waves) and the „superposition principle" for „completeness", nevertheless he has to declare that there is no reality of some physical entity behind it (a branching „atom", or branching „elementary particle", or generally: a matter structure which shows a holistic division process, or even a branching field) - if the atomos hypothesis should still make any physical sense.

And, also interesting: The behavior of some physicists and their use of speech has changed slightly over the last ten years. In Bonn it seems to be allowed to speak from the simultaneous passage of a particle through the double-slit as it would be obvious and self-evident (see more in the press release, link above); but at other universities this kind of imagination and speaking is strongly forbidden until today, as it was over eight decades, because it makes no physical sense - *without a refutation of the atomos assumption*. Nevertheless would both of them claim to be in full accordance with the old Copenhagen interpretation! A little bit more precisely one could say, also to pronounce the importance of this experiment for the foundation of physics: The experiment shows (again) the true face of Nature, the non-atomistic constitution of their elementary structures. It proves that a reversible division process of single „atoms" takes place in reality, which is signed out by holistic and enantiomorphic properties, known as wholeness („entanglement") and spin (like in double-slit and polarization experiments).

Indeed, the wave or state function of quantum theory allows „dividing atoms" and light quanta, but only on the paper, by the superposition postulate, expressed only in mathematics - but not in reality. The *quantum mechanical interpretation* of that mathematics *does not* recognize a „splitting" or branching process as physical real. It denies the reality of a division process because of the incapability to accept the complete failure of the atomos hypothesis and the body term of mechanics as senseful physical concepts in the experiments! Instead of it we hear since over 85 years the declaration that a understanding of single events at the double slit and in similar situations (means: of field branching processes) is neither possible nor needed „on principle", and that there was never a difference between the quantum mechanical theory and the experiments. The quantum mechanical interpretation is not capable to capture the elementary, foundational importance of the holistic division and fusion process as the true elementary physical structure property, which has to replace the failed atomos concept. And, therefore we have all the right to conclude that quantum mechanics was and is not complete: It can't see the most important element of reality, the enantiomorph branched field structure (this is probably Einsteins revenge, nevertheless his separation argument, based on the mechanical picture of c as velocity and atomic assumptions, was even wrong ;-). More over, the quantum mechanical interpretation doesn't provide *any* ontological concept, and is therefore complete contra-productive in its epistemological and physical claims.

Written dec 2012, last correction: 13 dec 2015. It is a short english summary of the main content of my books: „Einstein´s Vermächtnis - Die Revolution der Physik: Die Auflösung des Welle/ Teilchen-Paradoxons" (2003), and „Quantum Top Secret - Die Lösung des Quantenrätsels. Metamorphose eines Weltbildes" (2008), written 2005/ 2006 in Copenhagen, published may 2008, Halle/Saale, Germany (no publisher, no endorsement). Both books are available only in German now (at Libri and amazon, also in US and UK). Additional information, web-essays, pictures, and illustrations of the key experiments: Mario Wingert - art, design, and science: **www.anatomy-of-emptiness.de**

http://www.anatomy-of-emptiness.de/projekt01/index.php?idcatside=82&lang=2

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