

## Cartesian Approach to Developing the Foundations of Quantum Physics

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In 1900, Planck presented an equation that became fundamental to quantum physics and paved the way for interpreting the nature of radiation. However, in a 1911 article where he attempted to theoretically justify this equation, some errors might have been introduced. In this paper, Planck proposed that the central concept in quantum physics is the quantum of action, which diminished the significance of the energy quantum. Many researchers argue that this approach was flawed, as it contradicted the foundational ideas he introduced in 1900, termed the “quantum hypothesis.”

Analysis indicates that after adopting the quantum of action as the pivotal concept, despite certain successful outcomes like the works of Bohr in 1913, de Broglie in 1922, and Schrödinger in 1926, there were also numerous erroneous results. These include Bose's theory, the ideal gas theories of Einstein, Planck, and Fermi, and the foundational equations of quantum mechanics. Consequently, there's a basis to assert that the subsequent evolution of theoretical physics encountered an impasse due to these reasons.

My Cartesian approach to theoretical research hinges on the following rational categorizations:

1. Examination of matter's interaction with other matter (MIM);
2. Analysis of matter's interaction with radiation (MIR);
3. Evaluation of matter's interaction with heat (MIH)."

And the most basic idea of the Cartesian approach is the thesis that the basis of the theory of natural scientific thinking are the equations of algebra and arithmetic, which should serve as the basis for solving problems of geometry, kinematics and physics. (You can read about this in my articles and books on the websites scicom.ru and namaz-altaev.kz).

Within the framework of the Cartesian approach, I initially managed to reveal the essence of the Hamilton-Jacobi-Schrödinger and Gibbs equations as two different solutions to the Hamilton equation for two different sets of particles, namely the set of particles subject to bonds and the set of particles not subject to bonds that move chaotically. Later, after such an interpretation of these equations, I was able to derive key relationships important for the development of new foundations of quantum statistical mechanics. We can say that the results of my research show that

the basic and productive concepts of quantum physics are the concepts of “particle” and “quantum of energy”.

In conclusion, I would like to emphasize the following points:

1. After obtaining the results in the field of the theory of MIM, it was revealed that similar results can be obtained for the theories of MIR and MIH. This is based on the assumption of deep analogies between these theoretical concepts of mine.
2. Confirmation of the correctness of my results in the field of MIM is that on their basis it was possible to solve in detail many problems in the theory of chemical equilibrium and chemical kinetics.
3. As for the theory of MIR, its correctness is confirmed by the following: on the basis of this theory, Planck's equation was theoretically substantiated, and also on its basis, justifications were obtained for the main results of Bohr's theory of 1913.
4. In the context of the MIT theory, proof of its correctness is the successful explanation of the phenomena of superconductivity and superfluidity when the temperature of certain objects decreases.

I hope that this message will help to understand the main essence of my research.

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