PYTHAGOREAN APPROACH TO QUANTUM PHYSICS

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By the Pythagorean approach, we mean the use of the theory of figurate numbers. The Pythagorean approach to quantum physics made it possible to investigate the periodic law of elements of Mendeleev, the periodic properties of atomic nuclei and other periodic phenomena of the microworld, for example, the structure of fullerenes. Periodical objects find their embodiment in geometric shapes. These mathematical shapes have a fractal form in the sense of self-similarity, construction according to the gnominal principle. In particular, the correspondence of the electronic subshells, shells of the atom, shells of the nucleus of the atom to the concept of ”gnomon”, introduced by the ancient Greek mathematician Heron of Alexandria, is shown.

The applied approach allows:

to extrapolate the increase in the size of periodic objects to infinity;

to derive algebraic formulas, for example, the formula for the charge of inert gases as a function of the principal quantum number n

$$Z = [(-1)^n(3n + 6) + 2n^3 + 12n^2 + 25n - 6]/12;$$

one of the results is an alternative to the Klechkovsky rule for obtaining a sequence of filling of electronic levels of an atom: the principal quantum number n, which corresponds to the period number in the traditional periodic system, is replaced by the period number of the Janet’s table (1929). The required number is determined not by the sum, but by the difference of the quantum numbers (n-1). As a result, there is no need to rank the identical results, which is the case in the Klechkovsky rule.

References.

1. Трифонов Д.Н. Периодическая система элементов. История в таблицах: Учебное пособие / РХТУ им. Д. И. Менделеева. — М., 1999. 68с.
2. Вейзе Д.Л. Пифагорейский подход к проблемам периодичности в современной науке. Математика в высшем образовании. 2011 год, №9 Стр. 109 — 126. ISSN:1729-5440
3. Weise, D. The Pythagorean approach to the problems of periodicity in chemistry and nuclear physics, In: Progress in Theoretical Chemistry and Physics, Vol. 12, Advanced Topics in Theoretical Chemical Physics, Edited by Jean Maruany, Roland Lefebvre, and Erkki J. Brändas, 459-477. ISBN 1-4020-1564-X