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Model of classical thermodynamics based on partition theory, earth attraction and semi-classical asymptotics

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Quantum mechanics has established a new physical picture of the world, a significant contribution being due to the famous treatise “Theoretical Physics” by Landau and Lifshits. In the “Statistical Physics” volume, they obtained the main equations of thermodynamics *without resorting to the so-called three main principles of thermodynamics*, which appear in all thermodynamics textbooks. Bohr’s liquid-drop model of nucleus does not involve attraction interaction of particles and is based on a potential well common for all nucleus elements. Our concept of thermodynamics is based on quantum mechanics and the Earth’s gravitational attraction as an element of a common potential well. We say that a condensate is soft if the gravitational forces push the heavier clusters of the solution to the bottom of the vessel, where they form a thin heavy liquid layer without becoming a hard precipitate. Thus, the critical isochore separates fluids into soft and heavy ones. This approach allows describing the behavior of isotherms in the domain of heavy fluids and determining the weight of heavy clusters for each gas. Our model of thermodynamics shows good agreement with experimental data and explains effects such as negative pressure and liquid–solid phase transition based solely on collisions between molecules and the Earth’s gravitational attraction without using attraction between molecules. N Bohr (1938) noticed the deep relationship between nuclear fission and the partition problem in number theory. The author involves methods of number theory as the third constituent of a new model of thermodynamics. This model does not apply to satellites, where weightlessness occurs.

Biography

V P Maslov is a professor of National Research University, Higher School of Economics (School of Applied Mathematics). In 1984, he was elected to Full Membership of the Mathematical section of Russian Academy of Sciences directly, without passing through the Corresponding Member stage. He has published over 600 papers and over 20 monographs. He has introduced a series of important notions of which Maslov-type index theory, Maslov classes, Maslov form, Maslov correction, Maslov WKB method, Maslov cycle, Maslov dequantization are best known.

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