

## Vladimir Valentinovich Lebedev (on his 60th birthday)

DOI: 10.3367/UFNe.0183.2013061.0669

June 22 of the year 2013 marks the 60th birthday of Vladimir Valentinovich Lebedev, Corresponding Member of the Russian Academy of Sciences (RAS), Director of the Landau Institute of Theoretical Physics, RAS, and Chair of Physics and Technology of Nanostructures at the Moscow Institute of Physics and Technology.

V V Lebedev was born in Moscow and graduated first from the famous 2nd High School of Mathematics (predominantly the nursery at that time for the best educational institutes in Moscow) and later from the Moscow Institute of Physics and Technology (MFTI in *Russ. abbr.*) (traditionally the nursery for physics institutes of the Academy of Sciences). Under I M Khalatnikov's supervision, he submitted and defended his thesis for Candidate of Physicomathematical Sciences, becoming one of the most brilliant representatives of the generation of the 'grandchildren' of the world-famous school of theoretical physics that grew up around L D Landau. The distinguishing feature of V V Lebedev's style of work is the exceptionally broad range of scientific interests, from purely scientific problems in the fields of, for example, the quark–gluon plasma or ultralow-temperature physics to the technologically important problems of subwavelength optics, information transmission, turbulence, and even biophysics. It is worth noting that V V Lebedev is interested in only truly complex and difficult problems. It would hardly be possible to spot a trivial one among the more than hundred and fifty his publications. Every one of Lebedev's papers has been executed at the forefront of contemporary science.

In the 1980s, V V Lebedev's main interests turned to liquid crystals, quantum liquids, and various kinds of films. In many cases, long-wavelength thermal fluctuations play an important role in the dynamics of such systems and significantly modify the classical behavior of the hydrodynamic modes owing to their nonlinear interactions. V V Lebedev developed a consistent theory of the dynamics of these systems, including the subtle aspect of renormalization. The contribution of thermal fluctuations in freely suspended smectic films dominates in the long-wavelength limit for all damped modes, and behaves as fractional powers of frequency. V V Lebedev summed up the results of studying fluctuation dynamics phenomena in two monographs (issued by Nauka and Springer publishing houses). In the same years, he developed the theory of weak crystallization and presented it in a review, highly in demand, in *Physics Reports*; he also solved the problem of dynamic interaction between the critical mode that arises in the vicinity of the second-order phase transition and large-scale (hydrodynamical) degrees of freedom.

In the 1990s, V V Lebedev's research interests shifted more to the field of turbulence interpreted in the broadest



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sense as the physics of highly nonequilibrium and nonlinear systems. In this field, he both received fundamental results (which demonstrated the presence of anomalous scaling in turbulence) and developed a formalism for the description of turbulent transport, which found numerous applications.

Not leaving behind his own efforts around the issues of turbulence and the physics of liquid crystals and membranes, V V Lebedev started intense work on the theory of transmission of signals through optical fiber, which are very important for sending huge quantities of information over great distances. He was able to suggest a number of approaches for solving problems in this area, taking into account all real factors: nonlinearity, noise, frozen-in chaos, etc. Attacking problems of this caliber required the entire armory of tools possessed by modern theoretical physics, from quantum field theory to classical hydrodynamics, and called for the development of new approaches shared with statistical physics of strongly nonequilibrium systems.

Age does not detract from V V Lebedev's scope of interests. He does not lock himself within any one clearly defined area of theoretical physics but continues to seek new problems which often lie at the interfaces between different sciences. He always seeks solutions to these problems by looking through the prism of experimental verification, in active cooperation with colleagues-experimentalists.

V V Lebedev carries a big load of teaching and lecturing. Six graduate students have received PhD degrees under his guidance. Together with I N Khlyustikov, a friend from his high-school days, and R K Bega, their physics teacher in high school, he wrote and published a textbook on electrostatics for high school. V V Lebedev presents a number of original courses at MFTI and wrote two very useful manuals for the university level students: one on the physics of partly ordered systems, and the other on macroscopic fluctuation-driven phenomena. V V Lebedev is a member of the Scientific Council of the UNESCO Centre for Theoretical Physics (Trieste, Italy); he also heads the Theses Council at the Institute for Theoretical Physics (ITF) of the Russian Academy of Sciences.

In all his activities, V V Lebedev is distinguished by his complete devotion to science, steadfast in purpose, and his ability to gather a team to pursue a serious, steadfast in purpose, and exciting problem. He demands the utmost from himself and likewise from his colleagues. It is this denial of relaxation that results in scientific achievement.

We wish Vladimir Valentinovich Lebedev all the best on this jubilee, wishing him health and even more success in science and in all his undertakings.

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