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TO THE MEMORY
OF OSTAP STEPANOVYCH PARASIUK

On November 22, 2007, the outstanding scientist in the field of mathematical and theoretical physics, the famous organizer of science, Academician of the NAS of Ukraine Ostap Stepanovych Parasiuk passed away.

O.S. Parasiuk was born on December 20, 1921 at the village of Bilky near the town of Peremyshl' in the L'viv region. He went to the Peremyshl' gymnasia and the L'viv lyceum and finished the latter in 1939. From January of 1940, O.S. Parasiuk was a student of the Physico-Mathematical Faculty of the L'viv University. At that time, such leading scientists of the European and world mathematical science as S. Banach, A. Mazur, and H. Steinhaus delivered lectures there. At the Faculty, the regular meetings of a scientific seminar guided by the prominent mathematician, one of the creators of functional analysis S. Banach, started. The young student attended all meetings and enthusiastically heard the reports on modern achievements in the field of mathematics.

However, his study at the University was interrupted. In 1941, the German troops occupied L'viv and closed the University. Ostap Parasiuk became to learn independently. In addition to mathematics, he took a great interest in physics and studied the foundations of quantum mechanics and electrodynamics. In 1944, the Soviet Red Army entered L'viv, and the young inhabitants including O.S. Parasiuk were mobilized. He fought as a soldier of the 4-th Ukrainian front and met the war end, May 1945, near Prague. In December of that year on the basis of the order on the demobilization of servicemen who were called up from higher schools, Ostap Parasiuk returned to the L'viv University and took an external degree in two years.

In 1947–1949, O.S. Parasiuk was a post-graduate at the recently inaugurated L'viv division of the Institute of Mathematics of the NAS of Ukraine. Under the guidance of Academician G.N. Savin, he worked in the field of mechanics and defended the candidate thesis "Plastic zones at the concentration of stresses near holes" already in September of 1949.

In 1949–1951, O.S. Parasiuk was a senior scientific researcher of the L'viv division of the Institute of Mathematics. In addition to the scientific activity, he gave lectures on mechanics and hydrodynamics at the L'viv University and actively participated in the organization of the activity of a newly established Institute of Machine Science and Automation. From 1952, O.S. Parasiuk was Deputy Director of this institute. Despite a great job in solving practical tasks set to the Institute of Machine Science and Automation, he did not left the great science: he was interested in problems of quantum electrodynamics and the general theory of quantized fields and acquainted with works of N.N. Bogolyubov.

The happy fate joined O.S. Parasiuk and Academician N.N. Bogolyubov in January of 1953. By the recommendation of B.N. Delaunay, the talented young scientist was invited to the doctoral course at

the V.A. Steklov Moscow Mathematical Institute. The acquaintance with N.N. Bogolyubov happened on the first day of the stay in Moscow in the room of the Director of the V.A. Steklov Institute Academician I.M. Vinogradov. Ostap Parasiuk knew the problems N.N. Bogolyubov developed. Therefore, the problem concerning the divergences in quantum field theory was arised at once. Already in a half year, the young researcher obtained the important result: a new technique to eliminate the divergences was developed, and a theorem on renormalizability of quantum electrodynamics in any order of perturbation theory was proved. The results of these investigations were published in a number of articles. These publications are the world-wide known classics of quantum theory.

In May of 1955, O.S. Parasiuk defended successfully the doctoral thesis "The theory of multiplication of field operators" at the V.A. Steklov Moscow Mathematical Institute of the Academy of Sciences of the USSR. Then he returned to L'viv, worked as a senior scientific researcher of the Institute of Mathematics of the Academy of Sciences of UkrSSR, and simultaneously lectured at the L'viv University.

In 1956, O.S. Parasiuk was transferred to Kiev Institute of Mathematics, where he was elected the head of the Department of Functional Analysis. In 1963, O.S. Parasiuk became the head of the Department of Theoretical Physics. In 1966, O.S. Parasiuk took the direct participation in the establishment of a new academic institute, the Institute for Theoretical Physics of the Academy of Sciences of UkrSSR, and then headed the Department of Mathematical Methods in Theoretical Physics. At this Institute, Ostap Parasiuk worked till the last days of his life.

In 1958, O.S. Parasiuk was elected Corresponding Member of the Academy of Sciences of UkrSSR, and, in 1964, he became Academician of the AS of UkrSSR. From 1966 till 1970, O.S. Parasiuk was a member of the Presidium of the AS of UkrSSR and Academician-Secretary of the Division of Physics and Astronomy. Just at that time with his active help, the Academy of Sciences of UkrSSR grew by two new institutes – Institute for Theoretical Physics and Institute for Nuclear Research.

The scientific activity of Ostap Parasiuk concerned many branches of modern mathematics and theoretical physics. The first cycle of scientific works he carried out under the supervision of Academician of the AS of UkrSSR G.M. Savin was related to problems of classical mathematical physics and mechanics. In 1949, O.S. Parasiuk together with D.T. Maizler

and E.L. Rvachova proved a multidimensional limiting theorem of probability theory.

For 1952–1953, O.S. Parasiuk carried out the cycle of works on the statistical theory of dynamical systems. In particular, he gave a simple proof of the theorem on the mixing of an orocyclic flow on surfaces with steady negative curvature and established the conditions of ergodicity for such dynamical systems. In subsequent works, these results were generalized to the case of three-dimensional manifolds. These works contain many profound ideas and algorithmic findings developed further by other researchers and are a significant part of stochastic dynamics.

The most important scientific achievement of O.S. Parasiuk is the subtracting procedure of elimination of the divergences in quantum field theory he constructed with N.N. Bogolyubov (the Bogolyubov-Parasiuk R-operation). The Parasiuk's approach to the problem of divergences in quantum field theory with the help of the theory of multiplication of distributions has revealed the profound physical nature of this, as was firstly considered, "mathematical special case". After the works by N.N. Bogolyubov, O.S. Parasiuk, and others as for the renormalization group-based interpretation of the subtracting procedure, it became clear that the appearance of divergences is a regular manifestation of the hierarchy of scales existing in the nature. Quantum field theory, which uses the notion of local field and pretends to the description of phenomena at arbitrarily small distances, is inevitably faced with the problems of interrelations of theoretical quantities with observable ones. Therefore, the renormalizability becomes an important heuristic principle of modern quantum field theory. This was brightly demonstrated by the construction of the united theory of electroweak interactions (its authors, S. Weinberg and A. Salam, became the Nobel's prize winners).

Since the appearance of the R-operation theory, the interest of researchers in the problem of renormalization in quantum field theory does not decrease. Hundreds of works developing and using the fundamental ideas advanced by N.N. Bogolyubov and O.S. Parasiuk have been published. However, the Bogolyubov–Parasyuk theorem and the R-operation prescription do not lose their invariable actual "working" status. New nontrivial efficient schemes of renormalization have been developed. However, each new scheme acquires the "social rights" only if it is consistent with the R-operation.

O.S. Parasiuk combined the scientific and scientific-organizational work with the pedagogical activity at

the L'viv and Kiev Universities. Several generations of scientists successfully working in the field of quantum field theory in Ukraine and abroad have grown on his course of lectures "Introduction to quantum field theory" which was given by O.S. Parasiuk at T. Shevchenko Kiev National University.

The scientific seminar, which was established and guided by O.S. Parasiuk, on the mathematical problems of quantum field theory is functioning in Kyiv since 1957. This seminar devoted to the actual questions of mathematical and theoretical physics has become a school for many physicist-theorists working in Kiev. The disciples of Ostap Parasiuk include Academicians and Corresponding Members of the National Academy of Sciences of Ukraine and many Doctors and Candidates of Science who are fruitfully working in the branches of mathematics and theoretical and mathematical physics.

The scientific, pedagogical, and public activity of Ostap Parasiuk was highly estimated by the state. For the participation in the Great Patriotic war, he was rewarded with the Patriotic War order. The scientific and pedagogical activity of O.S. Parasiuk was marked by two Labor Red Banner orders.

The going away of O.S. Parasiuk is the heavy irreparable loss of the Ukrainian and world science. However, having his outstanding pattern of self-renounced devotion to science as the compass, the scientific school of O.S. Parasiuk will live and create developing and realizing his ideas and scientific testaments.

The unforgettable Teacher will remain forever with his disciples. His scientific feat will be always the example for the future researchers. The memory of him will be remained forever in hearts of all who was lucky to be aware of Ostap Parasiuk.

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