Anatolii Volodymyrovych Skorokhod has passed away on January 4, 2011 at about 4 a.m. (Kyiv time). The world has lost an outstanding mathematician of our time. During the second half of the XX-th century, his works determined, to a great extent, the directions of investigations on the theory of stochastic processes not only in Ukraine but also in many probabilistic centers of the world.

A.V. Skorokhod was born on September 10, 1930 in the city of Nikopol (Dniepropetrovsk region of Ukraine) in the family of school teachers. In 1946, the family moved to the town of Kovel (Volyn region of Ukraine), where A.V. Skorokhod graduated from the secondary school in 1948. A few months after, he was admitted to studying at the University of Kyiv, Faculty of Mechanics and Mathematics. When being a student of the University, he was involved into some scientific researches in the fields of analysis and probability theory. He had published 5 scientific articles by the time he graduated from the University, in 1953. For three next years, he carried on his post-graduate studies at the University of Moscow under the guidance of Professor E.B.Dynkin. After those studies had been successfully accomplished, A.V. Skorokhod taught at the University of Kyiv during 1957–1964. In 1964, he became the Head of the Department of Theory of Stochastic Processes that had just been created at the Institute of Mathematics of the Ukrainian Academy of Sciences. A.V. Skorokhod combined his scientific activities there with his work as a Professor at the Kyiv University. In 1993, he moved to the USA, where he was appointed to a professorship at the Michigan State University, Department of Statistics and Probability. Since that year, he had been working there up to the time his disease made him unable to perform Professor's duties.

The main landmarks of Skorokhod's scientific career are as follows:

in 1957, he defended his Candidate dissertation;

in 1962, he defended his Doctoral dissertation;

in 1967, he was elected a Corresponding Member of the Ukrainian National Academy of Sciences;

in 1982, he was awarded the State Prize of the UkrSSR (jointly with I.I. Gikhman);

in 1985, he was elected an Academician of the Ukrainian National Academy of sciences;

in 2000, he was elected a Fellow of the American Academy of Arts and Science;
in 2003, he was awarded the State Prize of Ukraine (in a team of scientists).

He was the author of more than 300 scientific articles and published 23 monographs, some of them jointly with co-authors (the number of his monographs should be enlarged to 45 if their translations are taken into account).

The first series of Skorokhod's investigations that gave him an authority over the probabilists was devoted to the problem of a generalization of the well-known Donsker's invariance principle onto the situation where the limiting process was a general process with independent increments, not necessarily a continuous one, as it was in Donsker's result. When solving it, A.V. Skorokhod showed the uncommon intelligence and the ability to see the gist of a problem and to create an adequate method for solving it. The courage of thinking and the resolution, with which the young researcher set to work on the problem (those were the years of his graduate studying, 1953–1956), were impressive. In order to give comprehensive answers to all the questions that arose in the generalization of Donsker's result mentioned above, A.V. Skorokhod introduced several topologies into the space of functions without discontinuities of the second kind (one of these topologies named the Skorokhod topology became very useful in various branches of mathematics). Moreover, A.V. Skorokhod proposed an original approach to the problem based on the possibility to construct a given weakly convergent sequence of random elements and a limiting one on a single probability space in such a way that the sequence becomes convergent in probability. Making use of this method (named somewhat later the method of a single probability space), A.V. Skorokhod formulated and proved the generalization of Donsker's invariance principle in an accomplished form. Those results are now included into any fundamental monograph on the theory of stochastic processes.

It is important to emphasize that not only the results of Skorokhod's investigations during 1953–1956, but also the proposed methods for obtaining them, constituted his success by the time he had finished his graduate studies and defended his Candidate dissertation. Those were the so-called direct probabilistic methods to solve probabilistic problems. The most significant field of probability theory where the direct probabilistic methods are prevailing is the theory of stochastic differential equations. It is natural that A.V. Skorokhod, being perhaps inspired by his older colleague I.I. Gikhman, started his researches in that theory. The results of those investigations formed the basis of his doctoral dissertation and his first book "Studies in the Theory of Random Processes" that was published in 1961 by the University of Kyiv. The assertions expounded in that book, as well as the methods used by A.V. Skorokhod for proving them, were fundamentally different from those that were typical of the theory of stochastic differential equations by that time.

First, using the method of a single probability space (see above) and the compactness principle for a family of probability measures corresponding to the solutions of stochastic differential equations, he proved that there exists a solution to such an equation in the situation where its coefficients are only continuous functions (they may not satisfy the Lipschitz condition; this condition was very important in the theory of stochastic differential equations proposed by its creators: I.I. Gikhman and K. Itô).

Second, he found out the condition, under which the measures corresponding to the solutions to a pair of stochastic differential equations are absolutely continuous each with respect to other. Moreover, if that condition is fulfilled, a formula for the density of one measure with respect to another one was written down. Such formulae can be used for constructing the solutions to a stochastic differential equation with irregular coefficients, on the one hand. On the other hand, they are useful in the statistics of stochastic processes, when some parameters of the coefficients of an equation should be estimated or some hypothesis about the coefficients should be tested.

Third, in the case of one-dimensional equations generating diffusion processes, A.V. Skorokhod proposed the highly interesting idea to compare the solutions to a pair of equations, whose diffusion coefficients coincide and whose drift coefficients are connected each with other by an inequality. It turned out that the values of the solutions to such a pair of equations were connected by the same inequality at any instant of time, if only they did at the initial instant. Using this result, A.V. Skorokhod proved a very subtle and nice theorem on the existence and the uniqueness of a solution to a one-dimensional stochastic differential equation.

Fourth, making use of the method of a single probability space, A.V. Skorokhod proved several limit theorems on the weak convergence of a sequence of Markov chains to a solution to a stochastic differential equation.

Finally, he proposed to represent the sums of independent random variables by the values of a Wiener process at some random instants of time. Using this representation, he obtained a subtle asymptotic estimation for the probability that the sums mentioned above are situated between a given pair of curves.

In this way, the first book by A.V. Skorokhod was abundant in new ideas, new methods, and new results in the theory of stochastic differential equations, and it made him one of the leaders in that theory.

At the beginning of the 1960s, A.V. Skorokhod published several articles devoted to the theory of stochastic differential equations that described diffusion processes in a region with a boundary. Those were the pioneer works, and they stimulated a whole stream of investigations on the topic at many probabilistic centers in the world.

In the middle of the 1960s, A.V. Skorokhod investigated the problem of the local structure of a continuous Markov process (or such one that did not possess any discontinuities of the second kind). It was proved that, under some assumptions, there exists a random change of time for such a process that transforms it into a quasidiffusion one.

Among the notions that were introduced by A.V. Skorokhod during 1970–1990, the notion of a stochastic semigroup should be mentioned. Some classes of such semigroups were described by him. It turned out that, under some conditions, a stochastic semigroup was a solution to a linear operator stochastic differential equation. An important role in those investigations was played by the notion of a random operator introduced by A.V. Skorokhod earlier. The most interesting of them was the notion of a strong linear random operator that singles out really stochastic objects, being not reduced to a family of ordinary bounded linear operators. The notion of a stochastic semigroup was applied by A.V. Skorokhod to investigating the problem of a stability of stochastic systems.

The notion of an extended stochastic integral (the Skorokhod integral) should be mentioned particularly. It gave a generalization of the notion of Itô's integral and turned out to be useful in many branches of mathematics and physics. The stochastic differential equations based on that notion are intensively investigated by the disciples of A.V. Skorokhod. They showed, in particular, that some problems of filtering a stochastic flow can be solved in terms of the Skorokhod integral.

During 1980–2005, A.V. Skorokhod investigated the asymptotic behavior of the solutions to stochastic differential equations and gave some applications of his results to studying the asymptotic behavior of some systems in biology and mechanics.

The works by A.V. Skorokhod during the last years were devoted to the problem of constructing various classes of stochastic processes on the space of configurations. Such processes describe the behavior of a system consisting of an infinite set of particles that are interacting with one another.

As was mentioned above, A.V. Skorokhod published many monographs in various branches of the theory of stochastic processes. We would like to mention here only a few of them that were translated into many languages and became classical: "Random

Processes with Independent Increments" (Moscow, Nauka, 1964; second ed., revised and suppl., 1986); "Integration in Hilbert Space" (Berlin, Springer, 1974; Russian issue: Moscow, Nauka, 1975); "Asymptotic Methods in the Theory of Stochastic Differential Equations" (Kyiv, Naukova Dumka, 1987; English issue: Transl. of Math. Monogr. 78, American Math. Soc., 1989); "Random Perturbation Methods with Applications in Science and Engineering" (Applied Math. Sci., 150, Berlin, Springer, 2002; co-authors F.C. Hoppensteadt and H. Salehi); "Introduction to the Theory of Stochastic Processes" (Moscow, Nauka, 1965; second ed., revised and suppl., 1977; Polish transl., 1968; English transl., 1968; second Engl. ed., 1996; co-author I.I. Gikhman); "Stochastic Differential Equations" (Kyiv, Naukova Dumka, 1968; German transl., 1971; Engl. transl., 1972; co-author I.I. Gikhman); "Theory of Random Processes" (Moscow, Nauka, Vol. I – 1971; Vol. II – 1973; Vol. III – 1975; co-author I.I. Gikhman; Engl. transl., New York, Springer, Vol. I – 1974; Vol. II – 2004; Vol. III – 2007); "Stochastic Differential Equations and Their Applications" (Kyiv, Naukova Dumka, 1982; co-author I.I. Gikhman).

It is impossible to overestimate the contribution of A.V. Skorokhod to the process of formation of the Ukrainian probabilistic school. His lectures at the University of Kyiv were not ordinary: his unceasing creative cogitations often inspired him to prove some assertions impromptu and his students thus turned out to become the unintentional co-participants of a creative scientific work. Owing to A.V. Skorokhod, the Kyiv probabilistic seminars were renowned among the scientists not only from the former USSR but also from its abroad. Under Skorokhod's supervising, more than 50 graduate students defended their Candidate dissertations, 17 his disciples became the Doctors of Mathematics. It should be added that A.V. Skorokhod paid a considerable attention to popularizing mathematics among schoolchildren. He was a Rector of the University of Young Mathematicians that was in action at the Institute of Mathematics in Kyiv during about 10 years. Each academic year at that University started working with a lecture delivered by A.V. Skorokhod. He published 16 textbooks and popular-science books (some of them with co-authors).

A.V. Skorokhod was always independent in his opinion and was able to hold his ground, though it was quite dangerous under the totalitarian regime. In 1968, he took part in the action of the group of Ukrainian intellectuals defending the constitutional rights of citizens of the country. All the participants of that action were censured. As a result, A.V. Skorokhod was not allowed to lecture students and advise post-graduates, he was excluded from the editorial boards of some scientific journals, and, for fifteen years, he was not permitted to participate in scientific conferences abroad. He stood that forced limitation of his own rights with proper pride. He told himself that time that mathematics saved him from all the life troubles. During those fifteen years of disfavor, he worked particularly fruitfully. And his being not a participant of any international conference that time gave birth to the opinion among foreign scientists that "Skorokhod" was the collective name of a group of Soviet mathematicians like a group of French mathematicians united under the name "Bourbaki".

The contribution of A.V. Skorokhod to the theory of stochastic processes is universally recognized. His ideas, the methods proposed by him, and the results obtained by him will always serve to the development of mathematics. His path of life, his courage, his decency, his love of Ukraine will remain for his colleagues and disciples as the main life's precept.

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