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Vladimir Ivanovich Smirnov (1887-1974)

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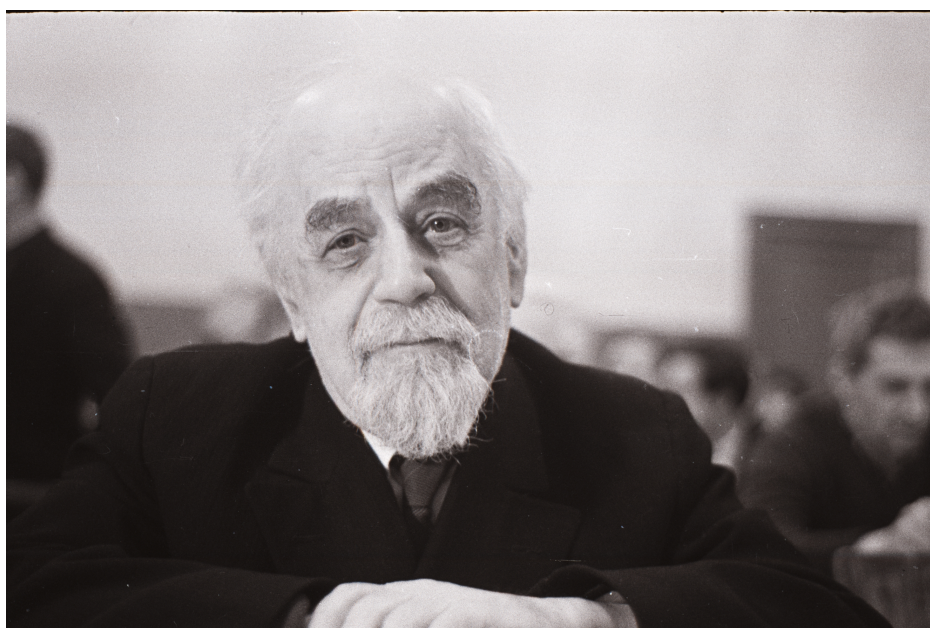
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Abstract

The year 2017 marked the 130th anniversary of the prominent Russian mathematician Vladimir Ivanovich Smirnov. We review some aspects of his life, and his mathematical accomplishments.

The year 2017 marked the 130th anniversary of the prominent Russian mathematician Vladimir Ivanovich Smirnov. He was a representative and a follower of the famous St. Petersburg mathematical school, the origin of which can be traced back to L. Euler. He was an outstanding figure of mathematical education and phenomenal organizer of science. His knowledge of physics, history, philosophy and music made him a real encylclopedist. It is hard to grasp the magnitude of his achievements in their entirety. However, let's take everything in order...

Vladimir Smirnov, born on 10 June 1887 in St. Petersburg, was the youngest of the ten sons of a clergyman. In high school, Vladimir attended the renowned Second Gymnasium, the oldest gymnasium in Russian Empire. Here he was luck to learn mathematics from an excellent teacher Ya.V. Iodynskiy. Apart from the compulsory classes, Iodynskiy organized a home mathematical circle where he additionally trained his pupils for independent scientific work. Together with V.I.

Smirnov, an active part in the circle took A.A. Friedmann[1] and Ya.D. Tamarkin[2]. Friendship and scientific collaboration between the circle participants continued later for many years.

In 1905, Vladimir graduated from high school with a gold medal and entered the Physics and Mathematics Faculty of St. Petersburg University.

Smirnov's student years were marked by anti-goverment protests and strikes in Russia. The University was buzzing with the political unrest. Lectures were held irregularly. During the strikes, the classes were cancelled completely. Examinations could be taken at any time during the academic year, by appointment. Such a system required an independent work of students with textbooks, scientific monographs and papers, and it encouraged the creation of circles and working groups. Among the members of the student group, founded in 1908, were Smirnov, Friedmann, Tamarkin, Ya.A. Shohat[3] and A.S. Besicovitch[4]. These students studied almost without guidance from the university. However, some professors observed their development with interest.

In 1910, Smirnov graduated from the University with a First Class Diploma. During the next two years, he taught mathematics at one of the best private schools in St. Petersburg. Also at this time, Smirnov and his friends organized an informal seminar, where they taught themselves mini-courses in various fields of mathematics and mechanics. These mini-courses included, in partucular, theory of surfaces, complex analysis, potential theory, spherical functions.

In 1912, Smirnov was admitted to the University as a graduate student of Prof. V.A. Steklov[5]. The study program was quite intensive. As a master student[6], Smirnov had to sit four exams: differential equations and mathematical physics, number theory, probability theory and theoretical mechanics. The reading list included the works of Fourier, Sturm, Liouville, Floquet, Poincaré, Lyapunov and Steklov.

In addition to the recommended reading, Smirnov was interested in the latest results on analysis such as theory of integral equations. Steklov was skepti-

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[1] Alexander A. Friedmann (1888-1925) was a Russian physicist and mathematician best-known for his pioneering work on the theory of relativity.

[2] Yakov (Jacob) D. Tamarkin (1888-1945) was a Russian-American mathematician who made important contribution to mathematical analysis and ODEs. He was a proponent and a founding co-editor of the *Mathematical Reviews*. He was also a Vice-President of AMS in 1942-1943.

[3] Yankel (James) A. Shohat (1886-1944) was a Russian-American mathematician who worked on the moment problem.

[4] Abram S. Besicovitch (1891-1970) was a Russian-British mathematician, world-known specialist in the function theory, winner of the Silvester Medal.

[5] Vladimir A. Steklov (1864-1926) was a prominent Russian mathematician, mechanician and physicist. Nowadays, the Mathematical Institutes in Moscow and St. Petersburg are named after Steklov.

[6] The Master's Degree in Russian Empire corresponds to today's PhD.

cal about these new directions, so Smirnov studied the works of Frechet and the Riesz-Fisher Theorem on his own.

In 1913 Smirnov published (jointly with Friedmann) his first paper on the oscillatory discharge of a capacitor. The same year Vladimir Ivanovich married Ekaterina Nikolaevna Gorbunova, who was a gymnasium history teacher. Also at that time Smirnov began his teaching activities at universities. From 1912 he taught at St. Petersburg Mining Institute and at St. Petersburg Institute of Railway Engineering, and from 1916 he worked as Prof. A.V. Vasil'ev's[7] assistant at St. Petersburg University.

So, in the beginning Smirnov's life ran quite smoothly: high school, interest in mathematics, university, work under the guidance of the well-known mathematician Steklov, marriage, promotion. The future was promising to be happy and secure. However, the First World War (1914-1918), the Revolution (1917) and the Civil War (1918-1920) have completely destroyed these hopes. There was not enough food, heating...

In 1918, Smirnov defended his thesis *"The inversion problem of a linear second-order differential equation with four singular points"*. He had chosen the topic of his Thesis by himself. Steklov did not find this topic very attractive, but wrote a brilliant report and emphasized that Smirnov's work had opened new directions in the analytic theory of differential equations.

During the difficult post-revolutionary period many scientitsts were forced to leave hungry Petrograd[8]. In this situation, V.A. Steklov helped his students to find positions at provincial universities. Thus, in the autumn of 1918 Vladimir Ivanovich got a job as a privatdozent at the newly founded Tavria University in Simferopol, Crimea. By this time his family, i.e., his wife and her two daughters from the first marriage, also lived in Crimea, in Balaklava.

Life in Crimea turned out to be even scarier as in Petrograd. By 1920 the regime in Simferopol has changed seven times, and ordinary people kept disappearing. The greatest bloodshed occurred in 1920 when the Red Army had captured Crimea[9]. The winners regarded the university with liberally oriented scientists as an enemy lair. Smirnov, like many others, received a summon to the so-called "court". Fortunately, a "judge" allowed him to go home. At the same time the wife of Vladimir Ivanovich was executed by a court ruling[10].

Smirnov recounted this tragedy to Steklov and also informed him about the catastrophic situation at the Tavria University, asking for help with moving back

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[7]Alexander V. Vasil'ev (1853-1929) was a Russian mathematician, known for his activity as historian of mathematics and organizer of scientific life.

[8]In 1914, the city name was changed from St. Petersburg to Petrograd. In 1924 it was renamed to Leningrad, and in 1991 back to St. Petersburg.

[9]More than 50 000 people were shot in Crimea by the end of 1920.

[10]Smirnov supported the daughters of Ekaterina Nikolaevna for many years.

to Petrograd. This long-awaited trip took place in 1921. Smirnov returned to his *alma mater* and never left the University again. At this moment, the long-term activity of Vladimir Ivanovich as an organizer of mathematical life in Petrograd-Leningrad began.

Smirnov developed a fundamentally new mathematical course for physicists, encompassing the modern knowledge and methods. He gave lectures for physics students that spanned an unheard-of range of mathematical disciplines. In 1925, Smirnov founded the department of Theory of Functions of a Complex Variable. Also during these years, Smirnov established several regular scientific seminars: on the theory of functions of a complex variable, analytic theory of differential equations, approximation methods, functional analysis. These seminars attracted promising enthusiastic young Leningrad mathematicians, and thus they paved the way to the creation of world-known scientific schools in all these areas.

Vladimir Ivanovich was in touch with all major achievements in science. In 1920's he was one of the organizers and active members of the Leningrad Mathematical Society, which unfortunately was dissolved in 1930 due to political reasons. Smirnov was also at the heart of the Second All-Union Congress of Mathematicians (1932) in Leningrad, and we are also indebted to him for making the publication of the proceedings of the congress possible.

From 1929 to 1935 Smirnov was the head of the theoretical department of the Seismology Institute. Here, together with S.L. Sobolev[11], he applied a method of functionally invariant solutions for solving some complicated problems related to wave propagation.

In 1931, Smirnov became the deputy director of the Institute of Mathematics and Mechanics, organized on his initiative at the University. Two years later, he founded the department of Higher Mathematics at the Faculty of Physics. Smirnov remained its head for more than 40 years.

1934 was a special year for Vladimir Ivanovich: he married Elena Prokopievna Ochlopkova, who was his graduate student. After marriage she did not continue her research activity but worked as an Assistant Professor at the University. In 1935 the Smirnovs got their son Nikita.

The peaceful life was destroyed by the World War II. At the end of August 1941 Smirnov and his family, together with other University staff were evacuated from Leningrad to Yelabuga[12]. Conditions of daily life here were very hard. Most of the families had to content themselves with just one room to live. Also, the University employees had to provide themselves with firewood and to grow

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[11]Sergei L. Sobolev (1908-1989) was an outstanding Soviet mathematician working in mathematical analysis and PDEs. He introduced the notions (Sobolev spaces, distributions, etc.) that are now fundamental for several areas of mathematics. Nowadays, Institute of Mathematics in Novosibirsk is named after Sobolev.

[12]Yelabuga is a small town in the Republic of Tatarstan, located 200 kilometers east from Kazan.

vegetables in a small garden to save themselves from starvation.

Despite all the hardships, Smirnov continued to work actively. He taught mathematics at the Pedagogical Institute, and served as a high scholl examiner. In addition, Vladimir Ivanovich organized an aerodynamics group, which had carried out a series of studies on ballistics under his supervision. In 1943, Smirnov was elected a Member of the Academy of Sciences of the USSR.

Upon his return to Leningrad in 1944, Smirnov found the Faculty of Mathematics and Mechanics of Leningrad University in a pitiful state. The numbers of students were very low, professors even lower. For this reason, during the next 12 years Smirnov was in charge (successively or sometimes even simultaneously) of several departments: Elasticity Theory, Hydroaerodynamics, Theoretical Mechanics, Theory of Functions of a Complex Variable, and Mathematical Analysis. As soon as a suitably qualified candidate appeared, Vladimir Ivanovich would step down and hand over the responsibility to the young colleague.

Being for many years the only mathematician member of the Academy of Sciences in Leningrad, Smirnov had to communicate papers in all fields of mathematics to the *Doklady of Academy of Sciences*. He never treated this duty formally, and if necessary, he helped to improve the papers. There were cases when papers were completely rewritten with Smirnov's help.

Already in the early 1920's, Smirnov and Tamarkin began to write a textbook for technicians and physicists. The first two volumes were published in 1924 and 1926, respectively. However, the joint work did not continue for long because Tamarkin soon fled from the country. For further editions Smirnov extended and revised the material alone. Since 1930, "*A Course of Higher Mathematics*" began to appear only under the name of Smirnov.

By 1947, the *Course* has become a veritable mathematical encyclopedia in five volumes. It presents a systematic treatment of Calculus, Algebra, Differential Geometry, Ordinary Differential Equations, Vector Analysis, Fourier Series, Complex Analysis (including functions of several complex variables), Special Functions, Theory of Group Representations, Calculus of Variations, Integral Equations, Partial Differential Equations and Boundary Value Problems. The 5th volume was the first Russian textbook on Functional Analysis. In 1948, the *Course* was awarded the Stalin Prize.

Smirnov continued to refine and supplement the *Course* throughout his life. Actually this activity stretched for over 50 years. It was truly Smirnov's life's work! The *Course* was reissued many times (in particular, up to now the first two volumes were reprinted 24 times) and translated into 8 languages. Nowadays, these books can be found in almost every university library around the world.

In the fall of 1947, Vladimir Ivanovich initiated a scientific seminar on mathematical physics bringing together a major part of the Leningrad mathematicians working in the field of partial differential equations and their applications. Almost

all Soviet experts in PDEs viewed a possibility to give a talk at this seminar as an honour. Among the speakers of the seminar there were also many famous foreign mathematicians such as R. Courant, J. Leray, P. Lax, K.O. Friedrichs etc. Now this seminar is named after V.I. Smirnov. In 2017, it celebrated its 70th anniversary.

In 1956, on Smirnov's initiative the department of Mathematical Physics was established at the Faculty of Mathematics and Mechanics. The purpose of this department was the training of highly qualified specialists in modern problems of PDEs. Smirnov hired for teaching both well-known scientists (e.g., S.G. Mikhlin[13], O.A. Ladyzhenskaya[14]) and young talented mathematicians. Smirnov was the head of this department and of the Higher Mathematics department at the Physics Faculty) until the end of his life.

In the mid-fifties, after Stalin's death, the idea of the revival of Leningrad Mathematical Society was again in the air. In 1957 Smirnov established the Leningrad General Mathematical Seminar. Two years later, on the basis of this seminar the Mathematical Society was restored, and Vladimir Ivanovich was elected its Honorary President.

Smirnov kept working actively until the age 85. In 1972 he was struck down by a sudden illness which took his life in two years. Vladimir Ivanovich passed away on 11 January 1974. He was buried on the Komarovo Cemetery[15].

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Smirnov's scientific results are overshadowed by his tremendous educational and organizational activities. Nevertheless, one should not forget that he is the author of several remarkable results in various fields of analysis.

The first important cycle of Smirnov's works (including his Thesis) is connected with the analytical theory of ordinary differential equations. Among these works we mention only the ones that are concerned with the problem of inversion for a linear second-order differential equation with four singular points. For the case of three singular points, such a problem was comprehensively studied by K.H.A. Schwarz. Smirnov gave a complete solution of the problem with four singularities. His investigations were carried out in a quite elegant analytical way.

A large number of Smirnov's papers are devoted to the study of the boundary properties of analytic functions and theory of approximations. He found the

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[13]Solomon G. Mikhlin (1908-1990) was a famous Soviet mathematician working in analysis, integral equations and computational mathematics. He is best known for the introduction of the concept of "symbol of a singular integral operator".

[14]Olga A. Ladyzhenskaya (1922-2004) was a prominent Soviet and Russian mathematician known for her work on PDEs (especially Hilbert's 19th problem) and fluid dynamics. President of the St. Petersburg Mathematical Society (1990-1998).

[15]Komarovo is a small summer-resort in 45 km away from Leningrad. Smirnov, among some other members of the Soviet Academy of Sciences, had summer residence ("dacha") there.

canonical factorization of a function from Nevanlinna class[16]. He also singled out special subclasses of the Nevanlinna class. Now these subclasses are called Smirnov's classes. They are the best known and most thoroughly studied generalizations of the Hardy classes. Smirnov's classes emerge in natural way when tackling various analytic questions, including those from approximation theory. When studying approximations, Smirnov introduced a class of domains that later became known as Smirnov domains.

In the early 1960's, jointly with N.A. Lebedev[17], Smirnov wrote the monograph "*Functions of a complex variable: constructive theory*" which contained modern results on the subject, including the authors' contribution. The book was translated into English and highly appreciated by the experts.

The third essential group of Smirnov's results relates to the propagation of sound and elastic waves. He discovered the existence of the so-called functional invariant solutions of the wave equation (families of solutions depending on functional parameters). As a result, all physically relevant fundamental solutions of the wave equation with three space variables were constructed. Singular solutions of the three dimensional dynamical system of elasticity theory possessing axial symmetry were constructed as well. The works of Smirnov and Sobolev brought the Soviet school of theoretical seismology to the forefront of this research in the world.

Considering the mixed boundary value problems for the wave equation and for the dynamical system of elasticity theory in the ball, Smirnov suggested a method which was later called the Smirnov method of incomplete separation of variables[18].

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Smirnov was a brilliant university teacher and lecturer. His lectures were not only elegant and comprehensible. In his exposition, the functions, integrals, and equations behaved as animate creatures.

His lectures on general courses Smirnov began with classical examples, then explained the basic notions and ideas. After this, he would change the tone of his voice, and in the last ten minutes of the lecture would give two or even three times more material as before, with the possible generalizations of both mathematical and physical nature. Each student could decide for himself how far to follow the lecturer. Note that Smirnov's lectures were also attended by people who were not formally university students.

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[16]Later this factorization was rediscovered by R.H. Nevanlinna. Sometimes it is called Nevanlinna factorization.

[17]Nikolai A. Lebedev (1919-1982) was a Soviet mathematician who worked on the theory of functions of a complex variable.

[18]also known as the space-time triangle diagram (STTD) technique.

Figure 1: V.I. Smirnov during the lecture (1951)

According to *Mathematics Genealogy Project*, Vladimir Ivanovich had only 12 PhD students and Postdocs: N.P. Erugin[19], G.M. Goluzin[20], V.P. Havin[21], L.V. Kantorovich[22], P.P. Korovkin[23], V.D. Kupradze[24], I.A. Lappo-Danilevsky[25], S.M.

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[19]Nikolay P. Erugin (1907-1990) was a Soviet mathematician working in the field of ODEs.

[20]Gennadiy M. Goluzin (1906-1952) was a Soviet mathematician known for his works in geometric theory of functions of a complex variable.

[21]Victor P. Havin (1933-2015) was a prominent Soviet and Russian mathematician known for his works in analysis. Among his students there are many famous analysts including the Fields medalist Stanislav K. Smirnov (2010).

[22]Leonid V. Kantorovich (1912-1986) was an outstanding Soviet mathematician working in the fields of functional analysis, computational mathematics and mathematical economy. He introduced the notion of normed vector lattices, which are called *K-spaces* in his honor. He was the winner of the Nobel Memorial Prize in Economics (1975) for "contribution to the theory of optimum allocation of resources".

[23]Pavel P. Korovkin (1913-1985) was a Soviet mathematician working in the field of analysis.

[24]Viktor D. Kupradze (1903-1985) was a Soviet mathematician known for his works in the elasticity theory and integral equations.

[25]Ivan A. Lappo-Danilevsky (1896-1931) was a Soviet mathematician known for his fundamental results on linear differential equations and analytic functions of matrices.

Lozinsky[26], S.G. Mikhlin, A.L. Shahinyan[27], S.L. Sobolev and V.A. Yakubovich[28]. However, this number was immeasurably smaller than the number of people who profited from Smirnov's supervision, consultations, and advice.

In Smirnov's own words, the main goal of his life was to carry the knowledge, received from his great teachers, through the years of wars and ruin, and pass it on to new generations.

Smirnov's extensive knowledge is well illustrated by the following example : in 1950's he looked through **all** the PhD theses in mathematics and mechanics, defended in Leningrad. A deep general understanding of mathematics as one entity, explains why Smirnov supported and promoted even those mathematical areas where he had never worked himself. In particular, such areas include functional analysis and spectral theory of operators.

Mathematical and general Smirnov's encyclopedic knowledge and his proficiency in foreign languages made him a key person in such an important matter as new acquisitions for the Library of the Academy of Sciences. For many years, Vladimir Ivanovich was a consultant on mathematical and physical literature for the acquisition department of the library.

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Vladimir Ivanovich was a rare example of a scientist who combined his own research with professional activity as historian of his science.

Smirnov worked actively in the Commission on the History of Physical and Mathematical Sciences of the Academy of Sciences[29], and from 1951 to 1953 he served as its chairman. He was a member of the Editorial Boards and the author of several survey articles in the multivolume editions of *"The Complete Works by P.L. Chebyshev*[30]*"* (1946-1951), *"The History of the Academy of Sciences of the USSR"* (1958-1964), and *"The History of Homeland Mathematics"* (1966-1970). Vladimir Ivanovich was also the editor of the first Russian edition of *"The Selected Works by M.V. Ostrogradsky*[31]*"* (1958), and of the fundamental collec-

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[26]Sergey M. Lozinsky (1914-1985) was a Soviet mathematician known for his fundamental results on ODE s and computational mathematics. President of the Leningrad Mathematical Society (1965-1985).

[27]Artashes L. Shahinyan (1906-1978) was a Soviet mathematician known for his works in the theory of functions of a complex variable.

[28]Vladimir A. Yakubovich (1926-2012) was a prominent Soviet and Russian mathematician known for his works in control theory, winner of the IEEE Control Systems Award (1996).

[29]In 1953, this Commission has become a part of the Institute of the History of Natural Science and Technology.

[30]Pafnuty L. Chebyshev (1821-1894) was an outstanding Russian mathematician and mechanician, founder of the St. Petersburg mathematical school, who is remembered primarily for his works on number theory, probability and approximation theory.

[31]Mikhail V. Ostrogradsky (1801-1862) was an outstanding Russian mathematician, mechani-

tive volume *"Mathematics at the University of Petersburg-Leningrad"* (1970), for which Smirnov wrote several chapters too.

Vladimir Ivanovich had invested a tremendous effort into reviewing and publishing manuscripts of outstanding Russian mathematicians. Among them we mention D. Bernoulli[32], A.M. Lyapunov[33], A.N. Krylov[34], I.A. Lappo-Danilevsky.

The last case is, probably, unique in the history of science. A former student of Smirnov, Lappo-Danilevsky passed away at the age 34. Within 4 years after that, Vladimir Ivanovich (together with N.E. Kochin[35]) studied his manuscripts and rough drafts, filled in all the gaps, and eventually published 12 papers by Lappo-Danilevsky. This work can be likened to that of a fine art restorer.

A very special place in Smirnov's historical investigations is reserved for the study of the scientific heritage of L. Euler[36]. At the end of the 1950's Vladimir Ivanovich initiated a systematic study of the extensive St. Petersburg archives of Euler including hand-written notes and correspondence. In particular, to study Euler's notes on number theory, Smirnov appointed his own PhD student G.P. Matvievskaya[37].

As a result of these massive investigations, several volumes of Euler's works, including a 438 pages annotated index, were published. Smirnov also served as a president of Soviet part of joint Euler's Committee organized by Schweizerische Naturforschende Gesellschaft[38] and Academy of Sciences of the USSR.

Vladimir Ivanovich also penned a large number of biographical essays on Russian mathematicians such as Chebyshev, Steklov, Friedmann, N.M. Günter[39] and many others. These essays imprinted the living images of remarkable people.

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cian and organizer of mathematical education, who made the essential contributions in many fields of mathematics and physics.

[32]Daniel Bernoulli (1700-1782) was an outstanding Swiss mathematician and physicist, one of the founders of mathematical physics. He worked in St. Petersburg from 1725 till 1733. In this period, Bernoulli prepared his world known monograph *"Hydrodynamica"*.

[33]Alexander M. Lyapunov (1857-1918) was an outstanding Russian mathematician and mechanician. He created the stability theory of the dynamical systems and established several breakthrough results in mathematical physics and probability.

[34]Alexey N. Krylov (1863-1945) was an outstanding Russian and Soviet naval engineer and applied mathematician, a founder of Russian school of theoretical naval architecture.

[35]Nikolai E. Kochin (1901-1944) was a famous Soviet mathematician, one of the founders of theoretical meteorology.

[36]Leonhard Euler (1707-1783) was a great Swiss and Russian mathematician and physicist, who made fundamental discoveries in all branches of mathematics as well as in various natural sciences.

[37]Galina P. Matvievskaya (born 1930) is a Soviet and Russian expert in history of mathematics and oriental studies.

[38]since 1988 Swiss Academy of Natural Sciences.

[39]Nikolai M. Günter (1871-1941) was a famous Russian and Soviet mathematician known for his works in potential theory and PDEs.

For many years Smirnov served as the President of the Scientific Council of the Academic Archives and a member of the Scientific Council of Academic Library. He was the author and editor of several extensive bibliographic indices. His colleagues pointed out that a task requiring the work of a research group for its implementation was often carried out by Smirnov alone and was done very well and within the shortest time.

Smirnov's deepest knowledge of general history and of the history of science, as well as his special care in analysing factual material, amazed the contemporaries. Smirnov's articles on topics related to the history of science were so accurate in all the details and facts that they can be used as reliable sources for necessary references.

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The most important hobby of Smirnov throughout all his life was music. He knew music professionally, played piano well, and had a good musical memory. He often took to the concerts, that he attended, the scores and compared the played music with the original.

Every two weeks Vladimir Ivanovich held excellent musical recitals at home, during which he often played popular symphonies (for example by G. Mahler) adapted for piano four-hands. For a long time, his music partner was D.K. Faddeev[40]. When Smirnov and Faddeev played four-hands, no one was allowed to speak. Smirnov was immensely proud that at his home the listeners could enjoy 3 symphonies and 2 quartets in one evening. Vladimir Ivanovich also played duets with D.D. Shostakovich[41], who at the turn of the 1950's spent a summer in Komarovo at a dacha located next to Smirnov's dacha.

Only in his last years Smirnov was forced to restrict himself to listening to musical records.

Of literature, Smirnov liked the classical one. His favorite writer and the one he found most congenial was Dostoevsky. In the last decades of his life, Vladimir Ivanovich preferred to read memoirs. Also, Smirnov read a lot of philosophical literature (in particular, Spinosa) in the original languages.

Vladimir Ivanovich had a great love for Russian architectural heritage, expecially the churches and monasteries of the North-West part of Russia. Almost every summer he visited some secluded corner, favoured by the masters of past centuries.

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[40]Dmitry K. Faddeev (1907-1989) was a prominent Soviet mathematician known for his works in algebra, number theory and computational mathematics.

[41]Dmitry D. Shostakovich (1906-1975) was a Soviet composer and pianist, regarded as one of the greatest composers of the 20th century.

Smirnov liked brisk long distance walks. They helped him to remain cheerful and be efficient, and also served as a kind of healing for his not quite healthy heart.

Another hobby of Vladimir Ivanovich was playing cards, namely "vint"[42]. One of his regular card partner was N.M. Günter.

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Vladimir Ivanovich was a deeply religious person, an Orthodox Christian. During the Soviet period, practising religion was very difficult, and sometimes even dangerous. Nevertheless, he regularly made donations to the Church, and, for a long period, was a member of "The Twenties" (Parish Council) of the Prince St. Vladimir's Cathedral in Leningrad. At the same time, Smirnov never stressed his religiousness in every day contacts with people.

In the years of Stalin's terror, Smirnov was not afraid to write letters to the authorities (prosecutors, ministers, politicians) and to speak in defense of arrested colleagues. After one of these speeches, an NKVD[43] officer paused ominously and then said to him: 'I see, you are quite a brave man, Vladimir Ivanovich!' In addition, Smirnov supported the families of prosecuted people both financially and morally.

Also, many persons were obliged to Smirnov for the opportunity to remain mathematicians. If a talented student was not accepted for postgraduate study for political reasons or a mathematician was sent to work, where he could not use his professional knowledge, Vladimir Ivanovich fought for such people like a lion.

The humanism, integrity, incorruptibility and fortitude were Smirnov's outstanding features, determining his influence. Smirnov was also admired by all who knew him for his attractive personal qualities, his rare charm and exceptional modesty. His social circle included not only scientists, but also famous writers, artists, composers and musicians.

During his long life, this extraordinary man performed many good, wise and useful deeds. Vladimir Ivanovich lived and worked trying to give as much and take as little as possible, and this influenced people around him stronger than any orders or sermons on morality.

Acknowledgments

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[42]Vint (literally "screw") is a complicated card game of the bridge class.

[43]NKVD (the People's Commissariat for Internal Affairs) was the leading Soviet secret police organization from 1934 to 1946.