

This issue of the Eurasian Mathematical Journal
is dedicated to the memory of
Academician Sergei Mikhailovich Nikol'skii



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To the memory of Academician Sergei Mikhailovich Nikol'skii

On November 9, 2012, an outstanding mathematician Sergei Mikhailovich Nikol'skii died at the age of 107.

In the world mathematical community he is known for his fundamental results in functional analysis, the theory of approximation, the theory of quadrature formulas, the theory of function spaces and applications to variational methods of solving partial differential equations.¹

S.M. Nikol'skii created a large internationally recognized scientific school of mathematicians working on the theory of functions and its applications.

He is the author of over 500 publications, including over 300 scientific publications, three research monographs,² two textbooks for high schools, seven textbooks for schools, and three books of recollections.³

In 1954 he organized the seminar "Differentiable functions of several variables and applications", which became the internationally recognized leading seminar on the theory of function spaces, and for 56 years he was the head of this seminar (jointly at times with celebrated mathematicians O.V. Besov, V.I. Kondrashov, L.D. Kudryavtsev, and S.L. Sobolev).⁴ He was the editor of collections of works of participants of this seminar and their colleagues from all over the world: 18 issues of the Proceedings of the Steklov Institute of Mathematics titled "Investigations on the theory of differentiable functions of several variables and applications".

S.M. Nikol'skii was born in 1905 in the Perm province of Russia.

In 1929 he graduated from the Ekaterynoslavl Institute of Education and after graduation worked there. He then completed his postgraduate studies at the M.V. Lomonosov Moscow State University. His supervisor was the famous Academician A.N. Kolmogorov. In 1935 S.M. Nikol'skii defended his PhD thesis.

Since 1940 he worked at the Steklov Institute of Mathematics. In 1942 he defended his Doctor of Sciences thesis (Doctor Habilitatus). From 1953 till 1962 S.M. Nikol'skii was the Deputy Director of the Steklov Institute of Mathematics, through 1962 – 1988 he was the Head of the Department of Theory of Functions. For 30 years he was the

¹ Detailed survey of these results is given in the paper by O.V. Besov, V.A. Sadovnichy, and S.A. Telyakovskii "On the scientific work of S.M. Nikol'skii", dedicated to the 100th birthday of S.M. Nikol'skii (Uspekhi Mat. Nauk 60, no. 6 (2005), 5-20; English transl. in Russian Mathematical Surveys 60, no. 6 (2005), 1005-1020).

² S.M. Nikol'skii, *Quadrature formulae*, Fizmatgiz, Moscow, 1958; Ed. tehniča, București, 1964 (in Romanian); Hindustan Publ. Corp., Delhi, 1964; AERE transl., Harwell (Berkshire), 1966; second edition (with addendum by V.P. Korneichuk), Nauka, Moscow, 1974; third edition, Nauka, Moscow, 1979; fourth edition, Nauka, Moscow 1988; Mir, Moscu (in Spanish), 1990.

S.M. Nikol'skii, *Approximation of functions of several variables and embedding theorems*, Nauka, Moscow, 1969; Springer-Verlag, New York, 1975; second edition, Nauka, Moscow, 1977.

O.V. Besov, V.P. Il'in, S.M. Nikol'skii, *Integral representations and embedding theorems*, Nauka, Moscow, 1975; V.H. Winston and Sons, Washington, Vol. 1, 1978, Vol. 2, 1979; J. Wiley and Sons, New York, Vol. 1, 2, 1979; second edition, Nauka, Moscow, 1996.

³ Complete list of his publications can be found at the portal Math-Net.Ru.

⁴ This achievement deserves to be mentioned in the Guinness Book of Records.

Deputy Editor and then the Editor-in-Chief of the Proceedings of the Steklov Institute of Mathematics. He worked at this institute for over 70 years, until his death .

More than 40 PhD students defended PhD theses under supervision of S.M. Nikol'skii, more than 15 of them later defended Doctor of Sciences theses. Several of his pupils became corresponding members of the Academies of Sciences of Russia, Ukraine, and Kazakhstan.

S.M. Nikol'skii was a professor at the Department of Mathematics of the Moscow Institute of Physics and Technology (MIPT) since it was established in 1947, originally as the Faculty of Physics and Technology of the Moscow State University.

In 1947 he gave the very first lecture to students of MIPT – it was a lecture on calculus, and in 1997 he gave his last lecture to students of MIPT at the age of 92, also on calculus. Until recently S.M. Nikol'skii continued to work for this Department. MIPT graduates, many of whom themselves became well-known scientists, always remember with gratitude lectures by Sergei Mikhailovich and note their depth and emotion. He worked at this department for over 60 years.

Based on the lectures delivered at MIPT he wrote the two-volume “*Course of Mathematical Analysis*”, which was repeatedly revised and reprinted. This textbook of comparatively small volume combines sharpness and clarity with the breadth of the material. It became popular with students and teachers and was adopted as the primary textbook on analysis in many universities.

Together with his pupil Professor Ya.S. Bugrov he wrote the three-volume course “Higher Mathematics” for students of physical and engineering specialties, which was also repeatedly reprinted and used as a main course on mathematics in many institutions. Together with his pupil Professor M.K. Potapov and school teachers N.N. Reshetnikov and A.V. Shevkin, he wrote 7 textbooks for schoolchildren: “*Arithmetics*” for forms 5, 6, “*Algebra*” for forms 7, 8, and 9, and “*Algebra and Basics of Analysis*” for forms 10, 11.

Altogether Sergei Mikhailovich wrote a series of books on mathematical analysis in the wide sense from level zero to the top level.

Several books written by S.M. Nikol'skii were translated into foreign languages (into English, German, Spanish, Romanian, Latvian).

At different periods of his long life S.M. Nikol'skii worked as a head of mathematical departments at the Dnepropetrovsk State University (1936 – 1939), at the Moscow Motorways Institute (1943 – 1947), and at the Moscow Institute of Physics and Technology (1950 – 1954).

In 1954 he was one of the main organizers of the Soviet Reviews Journal (Referativnyi Zhurnal), and for 8 years was the Editor-in-Chief of this journal.

For many years S.M. Nikol'skii participated in the Higher Attestation Commission of the USSR as a member and the chairman of the Expert Commission on Mathematics. For several years he was the chairman of the State Examination Commission of the Mechanics and Mathematics Faculty of the Moscow State University.

The outstanding work of Academician S.M. Nikol'skii was recognized with the award of numerous titles and prizes. He is a winner of the Stalin Prize (1952), twice winner of the State Prize of the USSR (1977, 1987), the State Prize of Ukraine (1994), Award of the Government of the Russian Federation in the field of education (2002), Awards

and Gold Medals of Chebyshev (1972), Boltsano (Czech Republic, 1978), Copernicus (Poland, 1980), Vinogradov (1991), Kolmogorov (1995), Ostrogradskii (Ukraine, 2000), Award of the Moscow State University for outstanding contribution to mathematical education (2005), and others.

S.M. Nikol'skii was awarded several state medals and orders: the Medal for the Defense of Moscow, the Red Banner of Labour Order (1953), the Lenin Order (1975), the Order of October Revolution (1985), the Order for Services to the Fatherland, II degree (2005 – for his outstanding contribution to the development of national science and training of qualified specialists).

S.M. Nikol'skii became a corresponding member of the Academy of Sciences of the USSR in 1968 and a member in 1972. He was also a foreign member of the Academies of Sciences of Hungary, Poland, and Kazakhstan.

In 1995, aged 90, S.M. Nikol'skii visited the School of Mathematics of Cardiff University in Great Britain. In the account of his visit it was observed that he delivered his talk with the energy of a person half his age.

Till the age of 92 he gave regular lecture courses on calculus to students (to an audience of more than 200 students).

In 2001, aged 96, S.M. Nikol'skii delivered a plenary lecture in Berlin at the 3d Congress of the International Society for Analysis, its Applications, and Calculation, of which he was an honorary member.

In 2005, aged 100, S.M. Nikol'skii took an active part and delivered several talks at the large international conference in Moscow dedicated to his centenary.

In 2005, he received in the Kremlin the Order for Services to the Fatherland and was personally congratulated by the President of Russia V.V. Putin. In his response he used this opportunity to express strongly his concerns and worries about the state of higher education in Russia.

In 2008, aged 103, he gave a plenary talk at the international conference in Moscow dedicated to the 85th birthday of his associate and close friend the corresponding member of the Academy of Sciences of Russia L.D. Kudryavtsev.

Till the age of 105 he continued to be a head of the seminar "Differentiable functions of several variables and applications".

In August 2011, aged 106, he welcomed at his "dacha" (summer house) in Nikolina Gora (Moscow region) a large group of participants of the 8th Congress of the International Society for Analysis, its Applications, and Calculation held in Moscow at the Peoples' Friendship University of Russia. During the tea-and-coffee party he had long discussions on numerous topics with the guests and, as usual, told many vivid stories about various episodes of his life some of which could have complemented his popular book of recollections "*My Mathematical Century*" (Fasis, Moscow, 2003).

S.M. Nikol'skii visited Kazakhstan many times. For the first time he came to Kazakhstan in 1967 and participated in the All Kazakhstan Interuniversity Conference in Almaty.

He was a foreign member of the Academy of Sciences of Kazakhstan, an honorary professor of the Semipalatinsk (Semey) State University named after Shakarim, and he was awarded a medal of the Ministry of Education and Science of Kazakhstan for his contribution to the development of science in Kazakhstan.

Several of his former students worked and are working in Kazakhstan. Professor T.I. Amanov, a corresponding member of the Academy of Sciences of Kazakhstan, for many years was the Director of the Institute of Mathematics and Mechanics, Professor K.Zh. Nauryzbaev for many years worked at the Al-Farabi Kazakh National University. They had many students of their own. One of the former students of K.Zh. Nauryzbaev, Professor E.S. Smailov has for many years been the Director of the Institute of Applied Mathematics in Karaganda.

In 2003, S.M. Nikol'skii attended the conference at the Semey State University dedicated to the 80th anniversary of T.I. Amanov. For the last time he visited Kazakhstan in 2005, aged 100. This was the visit to Almaty on the occasion of the 40th anniversary of the Institute of Mathematics and Mechanics of the Academy of Sciences of Kazakhstan.

Sergei Mikhailovich Nikol'skii, an outstanding scientist, pedagogue, and an exceptional personality, will always be in our hearts.

On behalf of the Editorial Board
O.V. Besov and V.I. Burenkov
associates and former PhD students
of S.M. Nikol'skii