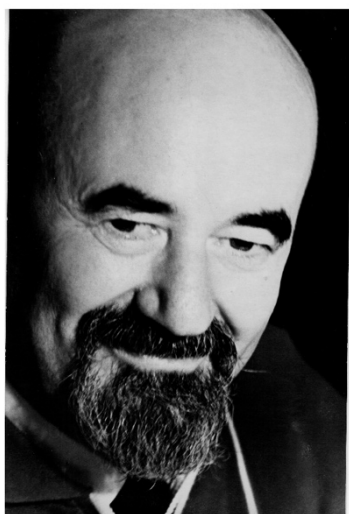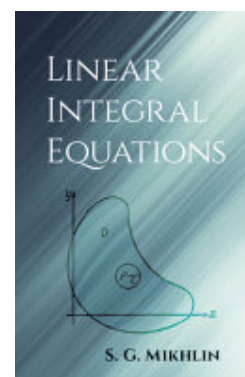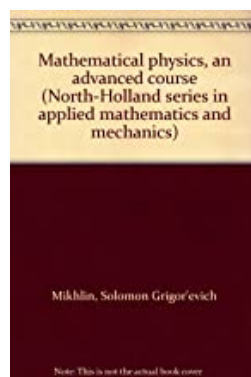# Solomon Grigoryevich Mikhlin (1908-1990)

S.G. Mikhlin was born in Kholmech, a Belorussian village, into a Jewish family of modest means: his real name was Zalman Girshevich Mikhlin, and he was the youngest of five children. He graduated from a secondary school in Gomel (Belorussia) in 1923 and entered the Leningrad State Pedagogical Institute, named after Herzen, in 1925. In January 1927 he became a second year student in the Department of Mathematics and Mechanics (MatMekh) of Leningrad State University after passing all the first year examinations without attending any lectures. Sergey Lvovich Sobolev studied in the same class as Mikhlin. Among their university professors were Nikolai Maximovich Günther and Vladimir Ivanovich Smirnov. The latter became Mikhlin's master thesis supervisor: the topic of the thesis, defended in 1929, was the convergence of double power series.

In 1930 Mikhlin started his teaching career, working for short periods in several Leningrad institutes. In 1932 he obtained a position at the Seismological Institute of the USSR Academy of Sciences, where he worked till 1941. He was awarded the degree of "Doktor nauk" in Mathematics and Physics in 1935 (equivalent to the Doctor of Science), without having to earn the "Kandidat nauk" degree (equivalent to a Ph.D.), and finally in 1937 he was promoted to the rank of professor. During World War II he was a professor at the State Alma Ata University. In 1944 Mikhlin returned to Leningrad State University as full professor. From 1964 to 1986 he headed the Laboratory of Numerical Methods at the Research Institute of Mathematics and Mechanics of the same university. From 1986 until his death in 1990 Mikhlin continued as a senior researcher at that laboratory.
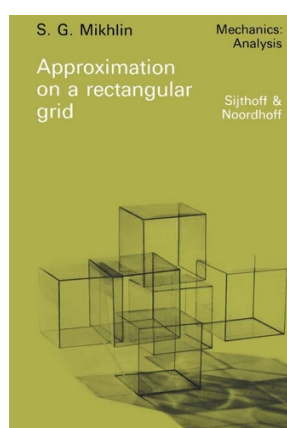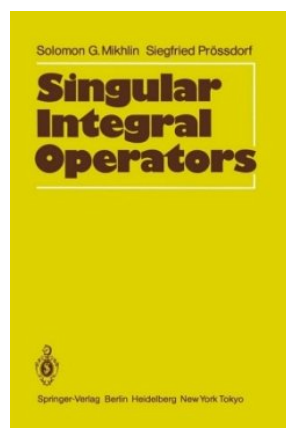
S.G. Mikhlin was the author of more than 220 scientific works including about 30 excellently written books and textbooks. On a large scale S.G. divided his research into "works", each of them consisting of articles, and as a rule resulted in writing a book. In the book he collected and regularized the results of his "work" considering it his duty. Mikhlin began his "work" impelled not so much by his own curiosity as by lofty objective ideas about the usefulness of the corresponding theory for the development of mathematics and its applications. Of course, scientific curiosity played its part too, but so to say secondarily. The aspect of sportsmanship in mathematics was exceedingly alien to Mikhlin's creativity.

Mikhlin's monographs and textbooks are remarkable from the point of view of pedagogics, especially those devoted to variational methods and different classes of integral equations. Their style and accessibility to poorly prepared readers made Mikhlin famous in the world of engineers, which was a rare achievement for a mathematician. Almost all his books have been translated into many languages (in particular, into English, German, Chinese, Japanese, and Hungarian) and have had a remarkable influence in giving a professional background to many young mathematicians.

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Mikhlin's special fields were theory of elasticity and plasticity, theory of integral operators, numerical methods in mathematical physics, boundary value problems. As I. Gohberg stated [1]: "Mikhlin considered the theory of singular integral equations as his favorite creation. Very soon his results led to pseudodifferential operators, and his notion the symbol (1936) became a cornerstone of this new theory which revolutionized partial differential equations." By G. Fichera [2], Mikhlin was one of the pioneers of modern numerical analysis together with Boris Galerkin, Alexander

Ostrowski, John von Neumann, Walter Ritz, and Mauro Picone.

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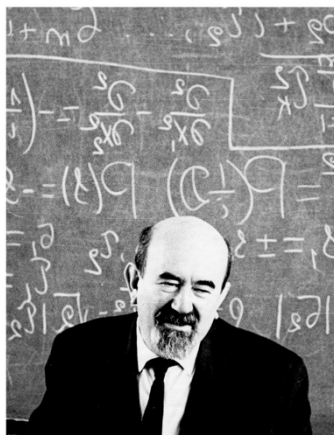
Mikhlin's mathematical idol was J. Hadamard. They first met in 1934 in Moscow where S.G. was among Hadamard's guides on the city tour. That was a memorable event for the young Mikhlin, who had graduated from Leningrad University five years earlier and who's first mathematical result was an extension of the Cauchy-Hadamard formula for the radius of convergence to double power series. I remember that once in 1960s Mikhlin proudly told me that someone found a resemblance between him and the famous French mathematician. Another Mikhlin's mathematical hero was his peer S.L. Sobolev. The latter always called Mikhlin by his diminutive name Zyama.

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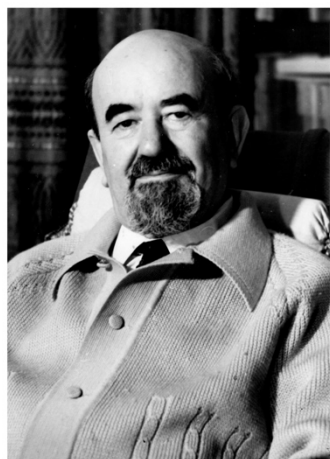
Mikhlin had an inherent sense of humor. He roared with laughter at the compositions of the "Oberiuts" (Society of Real Art, a Leningrad literary group) which in the sixties were accessible only through "Samizdat" (a Russian abbreviation of the words "self-publishing" which was persecuted by the Soviet regime). He remembered by heart "Plish und Plum" translated by D. Kharms from the German poem by Wilhelm Busch, and many poems by Edward Lear translated by S. Marshak, such as "The Owl and the Pussycat", "In the country of the Jumblies", "The Pobble who has no toes" and others.

S.G. never came to concerts, saying only that he perceived music as noise. Self-critically he said that he lacked capabilities for foreign languages, although I happened to hear him speaking German and French.

A convinced atheist, S.G. Mikhlin knew the Pentateuch and, by the way, reproached Thomas Mann for his exceedingly audacious handling of Torah in "Joseph and His Brothers". Mikhlin liked neither the latter novel nor M. Bulgakov's "Master and Margarita". In general, it was difficult to argue

with S.G. on humanitarian themes because of his confidence in his opinion, erudition and strength of argumentation. His speech was logical and aphoristic.

Mikhlin never prompted answer to poor achievers among the graduate students and liked to repeat after Ilf and Petrov: "Saving drowning people is their own problem".

S.G. Mikhlin knew that I had grown up without a father, who was killed at the front in1941, and, I would say, he looked after me in a fatherly way for many years. He often invited me to his place, talked about his life and answered most diverse questions. It was from him that I heard, still being a student, that Lenin was no less cruel a killer than Stalin, that concentration camps were first created under Lenin's rule in the Soviet Russia. S.G. Mikhlin meant the Party and Administration University officials when he told me: "They just have power, but we have theorems. Therefore, we are stronger!"

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In 1961 Mikhlin received the State Order of the Badge of Honour. He was awarded the Laurea honoris causa by the Karl-Marx-Stadt (now Chemnitz) Polytechnic University in 1968. He was also elected to membership of two academies, the German Academy of Sciences Leopoldina in 1970 and the Accademia Nazionale dei Lincei in 1981. When he was not allowed to travel to Italy to receive the title, the Italian mathematician G. Fichera and his wife brought to Leningrad the small gold lynx – a badge of Academician. They handed it over to Mikhlin in his apartment. I and my wife Tatyana were the only guests at that "ceremony".

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Solomon Grigoryevich, for his numerous disciples and for his friends, is not only an outstanding mathematician, but also a man of high moral standards, of kind heart, a man of great intelligence, profound knowledge and versality. His high qualities as a human being and as a scientist are largely appreciated by the mathematical community all over the world and have attracted many young hearts to love mathematics and scientific research.

References:
[1] I. Gohberg, Vladimir Maz'ya: Friend and Mathematician. Recollections. In book: Israel Gohberg and Friends. On the Occasion of his 80th Bithday. Birkhäuser, 2008.
[2] G Fichera, Solomon G Mikhlin (1908-1990) (Italian), *Atti della Accademia Nazionale dei Lincei, Rendiconti Lincei, Matematica e Applicazioni, Serie* (9) **5** (1) (1994), 49-61.

Vladimir Maz'ya