# FEDOR SEMENOVICH ROFE-BEKETOV
# (TO HIS 80 TH BIRTHDAY)

F. S. Rofe-Beketov, a prominent Ukrainian mathematician, was born on December 24, 1932, in Kharkiv, to a well-known family of the Beketovs-Alchevskys related to the great poet Blok, the chemist Mendeleev, the geologist Shcherbakov, and other famous personalities of culture and science. In 1955 he graduated from the Kharkiv State University. As an undergraduate, he authored two research papers published subsequently. In 1955-1958, he was a postgraduate student of the Kharkiv State University (advisor V. A. Marchenko). In 1962 he obtained his Candidate/PhD degree for the thesis "Some problems of spectral analysis of infinite systems of differential equations". His Doctor of Science degree was awarded in 1987 for the thesis "Problems of extension theory and spectral analysis of linear differential operators".

In 1958-1962, F. S. Rofe-Beketov worked in the Kharkiv Polytechnic Institute. From 1962, he works in the Mathematical Division of the Institute of Low Temperature Physics, National Academy of Sciences of Ukraine.

F. S. Rofe-Beketov's scientific interests are concentrated on spectral theory of differential operators. His first works were devoted to the construction of eigenfunction expansions for infinite systems of differential equations in the selfadjoint and nonselfadjoint cases, and to the inverse problems on the semi-axis for such systems. In early 60s he turned to the investigation of spectra of differential operators with periodic coefficients. Here he obtained a number of important results related to the problem regarding topology of the spectra of differential equations with complex-valued periodic coefficients stated by I. M. Gelfand in 1957. During that period, he also resolved the problem formulated by M. Sh. Birman and I. M. Glazman at the 4th Mathematical Congress of the USSR, about conditions for the finiteness of the number of discrete energy levels appearing in lacunas of continuous spectrum under perturbation of a periodic potential. These results were presented in his talk at the International Congress of Mathematicians in Moscow, 1966. Later F.S. returned to this subject and studied perturbations of spectra of almost periodic operators. He introduced the Kneser type constants (critical constants) for each spectral lacuna.

During the sixties, F. S. obtained also a complete solution of the inverse problem for the one-dimensional Schrödinger operator with an arbitrary real potential. He proved

necessary and sufficient conditions for the spectral matrix of such an operator. These conditions have found a variety of applications and are widely used. At the same period, he investigated (together with his student E. Kh. Khristov) the inverse scattering problem for the Sturm-Liouville operator with a strongly singular potential.

At the end of the sixties, F. S. Rofe-Beketov turned to extension theory of differential operators. He was the first who introduced in the extension theory the efficient method of linear relations. With this method, he obtained a description, in terms of boundary conditions, of all selfadjoint extensions of defifferential operators of arbitrary orders with bounded operator coefficients on a finite interval. By this time, the method has been widely generalized and found numerous applications described in a number of monographs and surveys. Another subject related to extension theory is the problem of essential selfadjointness of differential operators. In his papers (some of them were written jointly with his student A. G. Brusentsev), he obtained wide criteria of essential selfadjointness of strongly elliptic operators. Together with H. Kalf, he studied essential selfadjointness for a non-semibounded Schrödinger operator with a locally integrable potential. Together with his student V. I. Kogan, he obtained important results on possible values of the deficiency index of symmetric differential operators with complex coefficients.

In the seventies, F.S., together with his student V. I. Khrabustovskii, investigated stability of infinite periodic systems and found the dependence of their stability on integrability properties of the operator coefficients. Also in the late seventies and eighties he studied an important for applications problem of perturbations of spectra of semibounded operators. Here he dealt with changing domains of operators and strong resolvent convergence.

Simultaneously, F. S. Rofe-Beketov worked on oscillation properties of solutions of differential equations of arbitrary order with bounded operator coefficients. For the first time for such equations, he developed, jointly with his student A. M. Khol'kin, an oscillation theory covering, in particular, the classical Sturm theorem and a number of its well-known generalizations, like the Morse index theorem. These and other results were expounded in the monograph "Spectral analysis of differential operators. Interplay between spectral and oscillatory properties" by Rofe-Beketov and Khol'kin.

In a series of recent papers with his student E. I. Bondarenko (Zubkova), F. S. solved the inverse problems on the axis and semi-axis for the matrix Sturm-Liouville operator with a triangular potential.

F. S. Rofe-Beketov is a member of editorial boards of three mathematical journals. For his scientific achievements, he was awarded with the Ostrogradsky prize and the award "For educating young generation" of the National Academy of Sciences of Ukraine, the Bogolyubov memorial medal. He is a person of high culture and great erudition, vividly interested in history, literature, architecture, painting, and music. He works fruitfully on the history of the Beketov and Alchevsky families, deeply rooted not only in the history of Kharkiv but of the world science and culture.

We wish Fedor Semenovich Rofe-Beketov good health and long years of creative work on the whole range of subjects interesting for him.

The Editorial Board