

Kirill Andreevich Rodoskii (obituary)

Professor Kirill Andreevich Rodoskii, doctor of the physical and mathematical sciences, passed away in his 92nd year of life on 30 August 2004, after a long and severe illness.

He was born on 25 February 1913 in St. Petersburg. Upon finishing secondary school in 1930 he started working at the October Chemical Industrial Complex in Leningrad. After the assassination of S. M. Kirov in December 1934, the political trials and repression began. In March 1935 the Rodoskii family was accused of anti-Soviet agitation and exiled for five years to Saratov.

In those hard times Rodoskii, while working as an accountant, did not forget his passion for chess: he became the champion of Saratov Province.

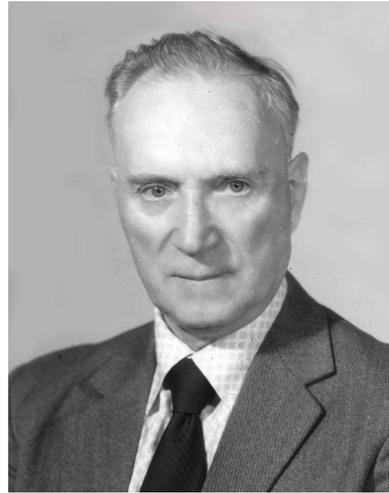
Furthermore, he continued his independent study of mathematics, which had attracted him since childhood. His uncommon diligence, resolve, and natural gifts helped him in 1936 to be admitted immediately to the second year of study in the Faculty of Physics and Mathematics at Saratov State University.

On graduating in 1940 he worked as an assistant in the Department of Mathematical Analysis. But after the creation in the same year of the Department of Algebra and Number Theory headed by the well-known scholar Professor Nikolai Grigor'evich Chudakov, who had been his first teacher, Rodoskii transferred to that department.

In 1942 he was conscripted into the army, but soon was demobilized because of a serious illness and sent to work as a secondary-school teacher in the village of Strigai in Saratov Province. Then from May of 1944 he performed non-combatant service in one of the Building and Erection Directorates in Saratov, where he worked as a tutor of young workers who had gone through industrial training.

After demobilization in 1945 Rodoskii again began working in his profession: first in the Saratov Economics Institute, then as a researcher in one of the scientific research institutes, and from 1949 once more in the Department of Algebra and Number Theory of Saratov State University.

In 1947 he defended his Ph.D. dissertation “Distribution of the prime numbers in short arithmetic progressions”. And in 1954 he defended his D.Sc. dissertation “On zeros of L -functions and prime numbers” in the Steklov Mathematical Institute



of the Academy of Sciences of the USSR. Academician Yu. V. Linnik regarded his dissertation as “superb, outstanding”.

In 1959 Rodoskii became head of the Department of Algebra and Geometry in the Faculty of Mathematics and Mechanics at Voronezh University.

In 1967 he moved to the Voronezh Pedagogical Institute, where he headed the Department of Algebra and Geometry up to 1975. In subsequent years he continued to work as a professor in this department.

His circle of research interests was distinguished by its breadth. His first papers involved the distribution of the prime numbers in arithmetic progressions $kn + l$, where $n \leq N$, and l and k are mutually prime numbers with k growing together with N . The concept of a short arithmetic progression was introduced by Rodoskii and became generally known.

Rodoskii obtained an asymptotic formula for the number of primes less than x belonging to the indicated progression as $x \rightarrow \infty$ with sufficiently large values of k . Moreover, for a finite difference of the Chebyshev function regarded on short arithmetic progressions he obtained an asymptotic formula which complemented results of Chudakov in connection with this problem. He proved also that the asymptotic approximation of the Chebyshev function fairly often has a very small error.

In a number of papers of Soviet and foreign mathematicians beginning in the 1930s it was shown that to solve certain problems on the distribution of the prime numbers it was sufficient to know only the ‘density of the zeros’ falling in the so-called ‘critical strip’ for the Dirichlet L -functions. In a joint paper with Chudakov in 1949 Rodoskii gave a survey of fundamental results obtained with the help of properties of the density of the zeros. One of the problems discussed there was the problem of the smallest prime number $p(k, l)$ in an arithmetic progression. The Hungarian mathematician P. Turán showed that $p(k, l) < k^c$, where c is an absolute constant independent of k . Turán’s proof was based on a then-unproved hypothesis about the density of the distribution of the zeros of Dirichlet L -functions with characters with a single modulus in the critical strip. Linnik proved the inequality for $p(k, l)$ without using this hypothesis. However, his proof was complicated and laborious. Rodoskii found a new and simpler proof of the inequality. The latter proof is in Chapter X of the book *Primzahlverteilung* by the Austrian mathematician K. Prachar (translated to Russian in 1967). A second proof of Linnik’s theorem was obtained seven years later by Turán.

Number theory experts were particularly interested in Rodoskii’s paper “On the exceptional zero”, in which a simpler proof was obtained for the famous theorem of the German mathematician C. Siegel on the exceptional zero of L -functions.

Rodoskii subsequently wrote some papers in which he used one of two analytic methods: the method of transformation of ‘weighted sums’ and the method of transformation of generating functions with the help of an integral expressing a normal probability distribution. By his first method he was able to get essentially improved estimates of certain trigonometric sums. The second method was subsequently used effectively in papers by the Hungarian mathematician I. Kátai. Rodoskii solved some problems in integer programming that had arisen in the theory of the circulation of money and were posed by Professor P. A. Parfan’yak at the Saratov Economics Institute already in 1947.

In the 1970s Rodosskii studied problems in the theory of Euclidean rings and problems of factorization in commutative rings. The results of years of investigations were published in his monograph *The Euclidean algorithm*, the first systematic exposition (in the world mathematical literature) of the theory of classical Euclidean rings, with applications to systems of linear equations and linear congruences over Euclidean rings.

He devoted much attention to his pedagogical work. Rodosskii was a brilliant teacher. His lectures remained long in the memories of his students. He lectured on linear algebra, number theory, and mathematical logic, gave various special courses, and guided the research of undergraduate and graduate students and teachers. In 1973 he was awarded an honorary diploma by the Ministry of Education of the Russian Soviet Federated Socialist Republic (RSFSR) and the Republican Committee of the Professional Union of University and Research Institute Workers of the RSFSR.

Rodosskii performed many tasks of public service. He was editor-in-chief of an inter-university collection of papers on number theory, a member of the Academic Council of the Central Directorate of Higher Educational Institutions in the Ministry of Education of the RSFSR, and a reviewer of articles and books at the request of the publishing house "Prosveshchenie" (Education) and the Steklov Mathematical Institute.

Kirill Andreevich Rodosskii was an exceptionally noble, intelligent, and steadfast man who was kind to all. A bright memory of him will always be preserved in the hearts of those who knew him.

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