Algebraic school

First significant studies on algebra in Kazan University were done by the great Russian mathematician **N.I. Lobachevski** (1792-1856). He developed one of the most widespread methods of approximation of algebraic equation roots. This method is represented in his book "Algebra" published in 1834.

The outstanding algebraist Nikolay Grigorievich Chebotarev (1894-1947) who worked in Kazan University from 1928 to 1947 is considered to be a founder of Kazan Algebraic School which became famous world-wide in the 40's. In 1934 due to N.G. Chebotarev's efforts, the Algebra Department was opened, in addition, Math and Mechanics Research Institute (now bearing his name) was established.

During this period, thorough studies of Galois Theory, algebraic numbers theory, Lie groups, extendable polynomials and resolvent problems were conducted by V.V. Morozov, I.D. Ado, N.N. Meyman and others.

N.G. Chebotarev achieved significant results in many spheres of algebra. In Galois theory he determined the structure of absolute Galois group class variable and limitations put on prime divisors of class numbers. In Lie groups' theory he proved the hypothesis expressed by Cartan in 1894, claiming that the subgroups of maximal order simple groups are regular; found the analytic character of measure existence in targeted Lie group representation. Studying the problem of algebraic equation rearrangement to the equation with the smallest number of free parameters, known as "resolvent problem", Nikolay Grigorievich got ground-breaking results and received ad vitam first-order Stalin award (1948).

V.V. Morozov obtained the whole classification of maximal non-semisimple subgroups of semisimple Lie groups, whereas later, Moscow mathematician E.B. Dynkin found the classification of semisimple maximal subgroups. Thanks to Morozov and Dynkin's efforts, the famous problem of Sophus Lie stated in the 19th century was completely solved. I.D. Ado proved the famous theorem, that each finite-dimensional Lie algebra of zero character has exact finite-dimensional linear representation.

Studying the popular problem of extendable polynomials, N.N. Meyman developed the algorithm that solves the problem of extendable polynomials for the most important case, when polynomials are examined over the set of real numbers.

Under the direction of N.G. Chebotarev, A.V. Dorodnov (1909-1988) fully solved the ancient problem of squarability of circular lunes with the help of compasses and a ruler.

Nowadays algebraic studies in Kazan are generally conducted at the Kazan University's Department of Algebra and the Division for Algebra and Mathematical Logic at N.G. Chebotarev Research Institute of Mathematics and Mechanics. Investigations are done on the ring, module and category theories

(I.I. Sakhaev, S.N. Tronin, etc.), on Lie algebra and irreducible module classifications over Cartan type algebra, and also on non-associative algebra (S.M. Skryabin, J.B. Jermolaev, A.Kh. Dolotkazin, N.A. Koreshkov, etc.).

Since the middle 70's of the last century, the research has also been made on relatively new algebra spheres with developing at the confluence of algebra and mathematical logic.

First research on mathematical logic at Kazan University was done by the professor Platon Sergeevich Poretskiy (1846-1907), an astronomer. In 1884 Poretskiy published his great piece of work "About the methods of solving logical equalities and the opposite method of mathematical logic" that played a significant role in logic algebra on the cusp of 19th and 20th centuries. On the basis of this work P.S. Poretskiy read the first in Russia course of mathematical logic at Kazan University.

Groundbreaking studies on mathematical logic were also done by the professor **Nikolay Alexandrovich Vasiliev** (1880-1940). In his pioneer works on "imaginary logic" (in such way he called the logic he was developing) he expressed the ideas that his contemporaries consider to be forestalling of the main principles of multiple valued logic and also intuitionistic logic and constructive logic.

N.K. Zamov made research on theory of proof, applicative mathematical logic and program synthesis theory. He developed the strategy of term sorting in resolution method, that is the resolving procedure for a broad class of predicate calculus formulas. He also suggested ways of resolution method for modal logic and a way of resolution method without assumption formulas skolemization.

M.M. Arslanov and his students studied algebraic structures of algorithmic nature which appear during the examination and classification of algorithmically unrecognizable objects. Broad expansion got the general methods developed by M.M. Arslanov, which allow to describe complete classes of arithmetical sets at a suitable level of arithmetical hierarchy, known in literature as Arslanov completeness criterion.