Speaker: Michael Tsfasman
Title: Quadratic residue patterns, elliptic curves, and a K3 surface

Abstract. In a joint work with Valentina Kiritchenko, Serge Vlăduţ. and Ilya Zakharevich, devoted to the memory of Lydia Goncharova, we consider several problems of the following type. What is the number of n-tuples of consecutive quadratic residues modulo a prime p? What is the number of n-tuples such that the difference of any two of them is a quadratic residue? Such problems are studied since the end of the 19th century. We state the last unpublished result of Lydia Goncharova, reformulate it and other known results of this type in terms of algebraic geometry, and prove them. The core of the Goncharova theorem is an unexpected relation between the number of points on a K3 surface and that on CM elliptic curves.