

Fourier transform as a triangular matrix

- Date: 27.5.2024
- Time: 2PM
- Address: Sokolovská 83, Praha
- Room: K3
- Speaker: George Lusztig (Massachusetts Institute of Technology)

Abstract: Fourier transform is an isomorphism of order 4 from the vector space of square-integrable functions on real numbers to itself. In the late 1800's Hermite described a complete set of eigenvectors of this linear map (involving the Hermite polynomials). We can replace this vector space with the vector space of complex-valued functions on a vector space of dimension $2n$ over the field with two elements with a nondegenerate symplectic form. This vector space has again a natural Fourier transform which plays a role in the study of representations of finite groups of Lie type. We are interested in proving an analog of Hermite's results in this context. But now instead of making the matrix of Fourier transform diagonal, we will make it only triangular.

The speaker: Professor Lusztig is known for his foundational work in representation theory, notably on objects closely related to algebraic groups, such as groups of Lie type, Hecke algebras, p -adic groups, and quantum groups. He has paved the way for modern geometric representation theory by introducing the fundamental new concepts of character sheaves, Deligne-Lusztig varieties, and Kazhdan-Lusztig polynomials. His research has been honored with numerous prizes, including the Cole Prize in Algebra, the Leroy P. Steele Prize, the Shaw Prize, and the Wolf Prize in Mathematics.