

PhD Projects 2020

Project 1.

Title: Complex geometry from an operator-theoretic viewpoint.

Supervisor: Dr. Z.A. Lykova; an other supervisor: Prof. N.J. Young

The project is to use operator theory to discover and prove results about the geometry and function theory of domains in \mathbb{C}^n . Students should have a basic knowledge of complex analysis in one variable and of linear operators on Hilbert space. A typical task is to construct an analytic function from a disc in \mathbb{C} to a concrete set in \mathbb{C}^n meeting some specifications. Problems of this type arise in engineering, though the present project is pure mathematical in outlook.

Project 2.

Title: Homology of topological algebras

Supervisor: Dr. Z.A. Lykova

The project is to solve questions on the structure and properties of topological and operator algebras from the viewpoint of homological algebra. Students should have a basic knowledge of functional analysis and algebra. I am particularly interested in the homological problems that arise in noncommutative geometry. A typical task is to study homological properties and cyclic-type cohomology of topological algebras. The theory has applications in many branches of mathematics, including the theory of de Rham homology in differential geometry, automatic continuity theory and K -theory.