

PhD research topic proposal (template)

BME, Doctoral School of Mathematics and Computer Science

Name and degree of supervisors: Ádám Gyenge, PhD

Are you willing to supervise Stipendium Hungaricum applicants?

No

Title of the topic: Algebraic Geometry

Short description:

Algebraic geometry originally studied the solutions of polynomial equation systems and their geometric properties. However, over the past couple of hundred years, its task has become much more general. As of today, it has become a discipline spanning from number theory through complex manifolds to theoretical physics. Algebraic geometry in a more general sense is one of the central areas of modern mathematics; a significant part of the Fields medals were awarded so far for results related to algebraic geometry.

Some possible lines of investigation:

- Nakajima quiver varieties
- Moduli spaces of sheaves
- Derived categories of sheaves
- Gromov-Witten invariants and quantum cohomology
- Donaldson-Thomas and Pandharipande-Thomas invariants
- Geometric representation theory
- Any question related to algebraic geometry chosen by the applicant

Requirements: MSc degree in Mathematics, knowledge of the basics of the subjects (e.g. completion of a course in Algebraic Geometry), some knowledge of related fields (topology, differential geometry)

Contact:

E-mail: Gyenge.Adam@ttk.bme.hu

Place of work:

Department of Algebra and Geometry, Budapest University of Technology and Economics