Graduate Seminar on Topics in Algebra & Computation

Prof. Dr. Nitin Saxena

Monday 1200-1400, LWK 0.008, Endenicher Allee 60.
Friday 1400-1600, LWK 0.008.

Background:
Students who are aware of the basics of computation and basic algebra will find the seminar especially interesting.

Outline:
This seminar will study some advanced topics in computational algebra. The highlights of the course are Gröbner basis, Algebraic-P/NP question and Elliptic curves.
The students will be expected to present at least two lectures during the semester. Some topics to choose from are given below (see Reference). To send your choices or to ask for more details contact ns@hcm.uni-bonn.de

- Black-box Factoring of multivariate polynomials.
- Gröbner basis and the Ideal Membership problem.
- Hilbert’s Nullstellensatz and Quantifier Elimination.
- Algebraic settings for the P=NP question.
- Three algebraic lower bounds: Strassen’s, Ben-Or’s & Mulmuley’s.
- Elliptic Curves - Divisors & Lines.
- Group Laws, Torsion points & Derivation.
- Division Polynomials, Ramification & Endomorphisms.
- Weil Pairing, Hasse’s Theorem & Schoof’s Algorithm.