

Decoding Dimensions: Algebraic Geometry & Number Theory Unveiled

**A long-term program on Algebraic Geometry and
Number Theory at the School of Mathematics at IPM.**

September 2023

Program Description:

In order to embark on a Ph.D. program in algebraic geometry or number theory, a substantial foundation is essential. This program is designed to equip students with the requisite skills and knowledge in these fields. The curriculum encompasses a diverse array of subjects (including but not limited to commutative algebra, Galois theory, homological algebra, scheme theory, class field theory, elliptic curves, and modular forms).

This program has been developed to possess a modular and adaptable structure, ensuring that individuals of all levels can derive value from it. The curriculum covers a range of offerings, including graduate-level courses as well as elementary supervised reading courses supplemented with exercise sessions and discussions. Tailored study groups will be formed based on the participants' backgrounds and interests, with the overarching objective of guiding students toward a better understanding of advanced concepts in algebraic geometry and number theory. Furthermore, advanced courses will be made available for those individuals who already possess a strong foundational knowledge in the subject matter.

In addition to the coursework, students will also have the opportunity to participate in seminars. The seminars will provide a platform for students to present their work and engage in discussions with their peers and researchers in the field.

To ensure the success of our students, we will also provide mentorship and guidance throughout their academic journey. We will also encourage collaboration among students, fostering a supportive and inclusive learning environment.

Furthermore, we understand the importance of networking and building connections in the mathematical community. Therefore, we hope to organize conferences and workshops where students can interact with leading experts in the field. These events will not only provide valuable learning opportunities but also open doors to potential collaborations.

Overall, our goal is to create a comprehensive program that caters to students at various levels and prepares them to engage in research within the domains of algebraic geometry or number theory. We believe that with the right guidance, support, and resources, every student has the potential to excel and contribute to the advancement of mathematics.