Division of Electrical, Information and Communication Engineering	Research field	Number Theory	Lab. ID EI29
Laboratory web site			

Research subjects

Our research focuses on number theory, elliptic curves, Iwasawa theory, and the Birch and Swinnerton-Dyer conjecture.

Master/Doctor course: Education policy, curriculum, typical activity in the laboratory

We offer lectures in related fields and hold seminars where students engage with specialised literature and research papers. Supervision of research and thesis work begins once a topic is selected. Active participation in conferences and external seminars is strongly encouraged.

Daily life in the laboratory, etc.

We hold regular individual meetings, along with joint seminars for the entire lab, where students present their work and engage in discussions. Collaboration among students to solve problems and learn from each other is also encouraged. Active participation in these discussions helps develop skills in exchanging ideas and critical thinking.

Message or comments by the laboratory faculty staffs

The Birch and Swinnerton-Dyer conjecture is one of the seven Millennium Prize Problems and is considered one of the most important and challenging unsolved problems in modern mathematics. This conjecture concerns elliptic curves, which play a crucial role in cryptography, forming the foundation for secure online communication and commercial transactions.

Iwasawa theory, proposed by Kenkichi Iwasawa in the mid-20th century, has origins that trace back to Kummer's work on Fermat's Last Theorem in the mid-19th century. Iwasawa theory serves as a bridge between two distinct mathematical objects appearing in the Birch and Swinnerton-Dyer formula, which are entirely different in nature: the Tate-Shafarevich group and complex L-functions. Today, Iwasawa theory is actively studied as a powerful tool for investigating the Birch and Swinnerton-Dyer conjecture.

Laboratory mail address	Yukako Kezuka <kezuka *at* se.kanazawa-u.ac.jp>