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**Research Field:** Mathematical Logic

**Key Words:** Set Theory, Large Cardinals, Forcing, Infinite Combinatorics

**Present Research:**

I am studying Set Theory, a branch of Mathematical Logic. Most mathematical objects and concepts can be expressed in terms of sets, and the standard axiom system ZFC (Zermelo-Fraenkel Set Theory ZF with Axiom of Choice) is a comprehensive axiom system in which almost all mathematics can be formalized. On the other hand, due to Cohen's forcing method, many mathematical propositions about infinite sets, such as the Continuum Hypothesis, are known to be undecidable in ZFC. Modern Set Theory analyzes various extensions of ZF or ZFC.

I am interested in extensions of ZFC by Large Cardinal Axioms and Forcing Axioms. I am studying what can be proved in such extensions about cardinal arithmetic and infinite combinatorics.

**Notice for the students:**

Mathematical Logic analyzes logic of mathematics in mathematical way. First of all, students should be familiar with various kinds of mathematics and mathematical methods.

There are several branches of Mathematical Logic such as Set Theory, Proof Theory, Model Theory, Computability Theory and Non-classical Logics. In any branch, students should be familiar with basics on the propositional logic and the predicate logic. In particular, the completeness of the predicate logic and the incompleteness of arithmetic are important. You can learn these basics in the following textbooks of Mathematical Logic, for example.

H. Enderton, "A Mathematical Introduction to Logic, 2<sup>nd</sup> edition", Academic Press.

D. van Dalen, "Logic and Structure, 5<sup>th</sup> edition", Springer.

H. Ebbinghaus et al., "Mathematical Logic, 3<sup>rd</sup> edition", Springer.

It may be difficult to study Mathematical Logic alone. I recommend students to consult experts.