Infinitary games in Boolean algebras and related forcing properties

Natasha Dobrinen
Penn State University

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Abstract

Infinitary distributive laws in Boolean algebras are equivalent to certain forcing properties. For instance, the (ω, ω)-distributive law holds in a Boolean algebra B iff forcing by B adds no new reals. Jech was the first to introduce an infinite game played by two players and use that game to characterize the (ω, ∞)-d.l. Jech and others have gone on to give game-theoretic characterizations of other distributive laws as well as show that certain games give rise to properties which are strictly intermediate between well-known forcing properties, such as Axiom A and properness.

In this talk, we will give some background on Boolean algebras and their relevance to general mathematics. We will discuss the relationship between forcing with complete Boolean algebras and partial orderings. We will present some results of Jech, Foreman, and Gray, as well as some of our own. We will conclude with a consistency result via κ^+-Suslin trees (generalizing a result of Jech) showing that (for many pairs of cardinals) each of these games is undetermined.

This talk should be accessible to graduate students.