DIRK SCHLIMM, McGill University

Towards a cognitive and pragmatic account of notations for propositional logic

In this talk I will consider Frege's *Begriffsschrift* (1879), the dot-notation introduced by Peano and employed by Whitehead and Russell in *Principia Mathematica* (1910), the so-called Polish notation of Łukasiewicz (1929), and the now common notation, as it can be found, e.g, for the most part in Hilbert and Ackermann's *Grundzüge der theoretischen Logik* (1928) and in contemporary logic textbooks. Notable differences between these notations include the use of a two-dimensional representation, the methods for grouping sub-expressions (parentheses vs. dots), and the order in which the connectives and their arguments are written. For the systematic comparison, I shall introduce *abstract syntax trees* (sometimes also called parsing trees) as canonical representations of propositional formulas and show how to translate between them and each of the other notations. I will argue that the amount of effort with which these translations can be effected gives us some information about the complexity of parsing the various notations, which impacts the cognitive effort needed for understanding them. Moreover, various advantages and disadvantages of the notations, in relation to certain particular aims, will be discussed and some historical reflections on the trade-offs regarding the use of the notations will be presented.