UIC Model Theory Seminar, February 24, 2004

Note special time: 2pm in 427 SEO

Theories with a finite number of countable models and group polygonometries

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We introduce the classification of complete countable first-order theories with a finite number of pairwise non-isomorphic countable models relative to the two main features: the Rudin-Keisler preorder and the distribution function of the number of limiting models over types. Herewith the main (nontrivial) part of the classification spreads on to Ehrenfeuchtian theories, i.e. non omega-categorical theories with a finite number of countable models. We generalize the classification to an arbitrary case of finite Rudin-Keisler preorder. We show that the same features play the key role in this case, and prove the consistency of any finite Rudin-Keisler preorder with an arbitrary distribution function f, satisfying the condition $\mathrm{rang} f \subset \omega \cup \{\omega, 2^\omega\}$. The notion of powerful digraph is defined and it is shown that the presence and the structure of a powerful digraph in the structure of nonisolated powerful type plays the defining role in the construction of Ehrenfeuchtian theories. The notions of group polygonometry and group trigonometry are defined and it is shown that the structure of any acyclic group trigonometry on a projective plane contains a structure of a powerful digraph.