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# SEMINÁRIO DE LÓGICA MATEMÁTICA

**Dia 25 de Junho (segunda-feira), sala 6.2.33 às 15:00**

## Model theory and decidability theory for adèle rings

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### Abstract:

To each number field  $K$  there is attached a locally compact ring  $A_K$ , the ring of adèles over  $K$ . This ring is built from the completions of  $K$  at equivalence classes of absolute values. These can be either  $p$ -adic or real, or complex. Harmonic analysis on the adèles is a fundamental technique in number theory (since the famous thesis of John Tate).

We analyze definable sets in adèle rings, and get definitive information on their topological structures, attempting to relate their measures to zeta functions. We use classical work by Feferman and Vaught to get a ring-theoretic quantifier elimination for adèle rings.

We give elementary invariants of adèle rings, and prove decidability results. This is connected to number-theoretic work on how much of  $K$  one can retrieve from the ring  $A_K$ .

(Joint with J. Derakhshan)

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