



## Invitation

Logic Colloquium

**Laura Wirth**

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*The Interplay of Languages, Automata  
and Monadic Second-Order Logic*

the talk will take place  
on **Monday, 19.12.22** at **15:15** in room **F426**

All interested are welcome to attend

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**Abstract:** A basic tool from Theoretical Computer Science for the specification of formal languages are finite automata. Research on the logical aspects of the theory of finite automata began in the early 1960s with the work of Büchi, Elgot and Trakhtenbrot on monadic second-order logic in the context of words. The basic idea of their approach is to use formulas of monadic second-order logic over a suitable signature to describe properties of words. Thus, monadic second-order logic provides another tool for the specification of languages. Büchi, Elgot and Trakhtenbrot independently derived that the two concepts – finite automata and monadic second-order logic – are even expressively equivalent. Hence, their equivalence result, referred to as Büchi-Elgot-Trakhtenbrot Theorem, establishes an early connection between Automata Theory and Mathematical Logic. In this talk, we provide an introduction to the above-mentioned concepts. Moreover, we present an extension of the Büchi-Elgot-Trakhtenbrot Theorem to formulas, involving free variables, whereas the original statement addresses only sentences. If time permits, we will further outline quantitative extensions of the above-mentioned concepts and results.

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Carolin Antos, Salma Kuhlmann  
Coordinators of the Logic Colloquium