CSPs over small templates

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Let A be a relational structure. Define $\mathrm{CSP}(A)$ to be the set of all relational structures B similar to A such that there is a homomorphism from B to A. In 2006, Andrei Bulatov proved that if A is a set of size 3, then the computational complexity of determining membership in $\mathrm{CSP}(A)$ is either polynomial time, or it is NP-complete. In this talk, I will discuss some recent advances in proving that this dichotomy also holds when A is a four element set.

This is a joint work with P. MARKOVIĆ (University of Novi Sad) and RALPH MCKENZIE (Vanderbilt University, Nashville).