## Amalgamation failures in semilinear residuated lattices Valeria Giustarini (valeria.giustarini@gmail.com) IIIA-CSIC

In this contribution we present some new results concerning the amalgamation property in varieties of residuated lattices. These are structures that play a crucial role in the field of algebraic logic; indeed, their equivalent algebraic semantics a la Blok-Pigozzi encompass classical logic and many important nonclassical logics, such as: intuitionistic logic, intermediate logics, many-valued logics, and relevance logics to name a few. The algebraic investigation of residuated lattices is then crucial in the systematic and comparative study of such logics. As a consequence of algebraizability, a most relevant bridge theorem between the logical and algebraic perspective allows one to study the interpolation property of a logic via the study of the amalgamation property in the corresponding class of algebras. Precisely, if a logic L has a variety V as its equivalent algebraic semantics, and V satisfies the congruence extension property, L has the deductive interpolation property if and only if V has the amalgamation property. We focus on the study of the amalgamation property in semilinear varieties of residuated lattices (i.e., residuated lattices that are subdirect products of chains), solving some long-standing open problems; most importantly, we establish that semilinear commutative integral residuated lattices and their 0-bounded version do not have the amalgamation property. As a consequence, the corresponding logics fail to have the deductive interpolation property.