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**A survey of residuated lattices.** (English) [Zbl 1070.06005](#)

Martínez, Jorge (ed.), Ordered algebraic structures. Proceedings of the conference on lattice-ordered groups and  $f$ -rings held at the University of Florida, Gainesville, FL, USA, February 28–March 3, 2001. Dordrecht: Kluwer Academic Publishers (ISBN 1-4020-0752-3). Developments in Mathematics 7, 19-56 (2002).

Summary: Residuation is a fundamental concept of ordered structures and categories. In this survey we consider the consequences of adding a residuated monoid operation to lattices. The resulting residuated lattices have been studied in several branches of mathematics, including the areas of lattice-ordered groups, ideal lattices of rings, linear logic and multi-valued logic. Our exposition aims to cover basic results and current developments, concentrating on the algebraic structure, the lattice of varieties, and decidability.

We end with a list of open problems that we hope will stimulate further research.

For the entire collection see [[Zbl 1068.06001](#)].

**MSC:**

- [06F05](#) Ordered semigroups and monoids
- [03B25](#) Decidability of theories and sets of sentences
- [08B15](#) Lattices of varieties
- [06-02](#) Research exposition (monographs, survey articles) pertaining to ordered structures

Cited in **5** Reviews  
Cited in **118** Documents

**Keywords:**

survey; residuated monoid operation; residuated lattices; lattice of varieties; decidability