

Bunge, Marta; Funk, Jonathon

Singular coverings of toposes. (English) Zbl 1106.18001

Lecture Notes in Mathematics 1890. Berlin: Springer (ISBN 3-540-36359-9/pbk). xii, 225 p. (2006).

The main objective in this book is to develop a fairly self-contained theory of certain singular coverings of toposes which the authors name complete spreads. What they call the theory of complete spreads is an extension of *R. H. Fox* (1957) in topology, and enjoys an unexpected connection with topos distributions in the sense of *F. W. Lawvere* (1983). Complete spreads may be put down as the geometry of distributions. A complete spread is a kind of geometric morphism that is dual to an étale geometric morphism.

The book is divided into three interrelated, yet distinct parts, both in content as well as in background and approach. In Part 1 the authors introduce distributions and complete spread geometric morphisms, which are clearly motivated by examples. They establish the main result of the book that there exists an adjoint equivalence between distributions on a topos \mathcal{E} and complete spread maps over \mathcal{E} with locally connected domain. The analogies multiply. In Part 2 the authors develop an axiomatic theory of complete spreads. It is shown, within the framework of 2-category theory, that all of the main theorems of the subject, such as the comprehensive factorization and the above mentioned adjoint equivalence, follow from certain key axioms (complete, closed, linear) satisfied by the symmetric monad. Part 3 is devoted to further aspects of distributions and complete spreads, such as localic, algebraic, lattice-theoretic and topological.

Throughout the book open problems are emphasized.

Reviewer: [Hirokazu Nishimura \(Tsukuba\)](#)

MSC:

- 18-02 Research exposition (monographs, survey articles) pertaining to category theory
- 55-02 Research exposition (monographs, survey articles) pertaining to algebraic topology
- 18B25 Topoi
- 18D05 Double categories, 2-categories, bicategories and generalizations (MSC2010)

Cited in **1** Review
Cited in **8** Documents

Keywords:

topos distribution; 2-category theory; étale geometric morphism; complete spreads

Full Text: [Link](#)