

1. Record Nr.	UNINA9910462552203321
Autore	Grandis Marco
Titolo	Homological algebra [[electronic resource] ] : the interplay of homology with distributive lattices and orthodox semigroups / / Marco Grandis
Pubbl/distr/stampa	Hackensack, N.J., : World Scientific, 2012
ISBN	1-281-60370-8 9786613784391 981-4407-07-0
Descrizione fisica	1 online resource (382 p.)
Disciplina	512/.55
Soggetti	Algebra, Homological Electronic books.
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Contents; Preface; Introduction; 0.1 Homological algebra in a non-abelian setting; 0.2 The coherence problem for subquotients; 0.3 The transfer functor; 0.4 Distributivity and coherence; 0.5 Universal models and crossword chasing; 0.6 Outline; 0.7 Further extensions; 0.8 Literature and terminology; 0.9 Acknowledgements; 1 Coherence and models in homological algebra; 1.1 Some basic notions; 1.1.1 Monomorphisms and epimorphisms; 1.1.2 Lattices; 1.1.3 Distributive and modular lattices; 1.2 Coherence and distributive lattices; 1.2.1 Subquotients and regular induction 1.2.2 Relations of abelian groups1.2.3 Induced relations and canonical isomorphisms; 1.2.4 Examples of incoherence; 1.2.5 Coherent systems of isomorphisms; 1.2.6 Lemma; 1.2.7 Coherence Theorem of homological algebra (Reduced form); 1.3 Coherence and crossword diagrams; 1.3.1 Representing a bifiltered object; 1.3.2 Extending the representation; 1.3.3 Preparing a further extension; 1.3.4 The complete representation; 1.3.5 The Jordan-Holder Theorem; 1.3.6 Representing a sequence of morphisms; 1.4 Coherence and representations of spectral sequences 1.4.1 The universal model of the filtered complex1.4.2 The spectral sequence; 1.4.3 The spectral sequence, continued; 1.4.4 Transgressions; 1.4.5 A non-distributive structure; 1.5 Introducing p-

exact categories; 1.5.1 Some terminology; 1.5.2 Pointed categories;  
 1.5.3 Kernels and cokernels; 1.5.4 Exact categories and exact functors;  
 1.5.5 Smallness; 1.5.6 Examples; 1.5.7 Galois connections; 1.5.8  
 Modular lattices and modular connections; 1.6 A synopsis of the  
 projective approach; 1.6.1 Direct and inverse images of abelian groups;  
 1.6.2 The transfer functor; 1.6.3 Distributivity and coherence  
 1.6.4 The category of sets and partial bijections 1.6.5 Generalisations;  
 1.7 Free modular lattices; 1.7.1 The Birkhoff Theorem (finite case);  
 1.7.2 The Birkhoff Theorem (general case); 2 Puppe-exact categories;  
 2.1 Abelian and p-exact categories; 2.1.1 Additive categories and  
 biproducts; 2.1.2 Lemma (Biproducts); 2.1.3 Theorem and Definition  
 (Semiadditive categories); 2.1.4 Additive categories; 2.1.5 Theorem and  
 definition (Abelian categories); 2.1.6 Biproducts in abelian categories;  
 2.1.7 Split products in p-exact categories; 2.1.8 Examples of split  
 products  
 2.1.9 Split products and abelian-valued functors 2.2 Subobjects,  
 quotients and the transfer functor; 2.2.1 Kernel duality; 2.2.2 Exact  
 sequences; 2.2.3 Theorem (Modular lattices); 2.2.4 Lemma (Pullbacks  
 and pushouts in p-exact categories); 2.2.5 Direct and inverse images;  
 2.2.6 Theorem and Definition (The transfer functor); 2.2.7  
 Subquotients; 2.2.8 Further remarks on modular lattices; 2.2.9 Lemma  
 (Noether isomorphisms); 2.3 Projective p-exact categories and  
 projective spaces; 2.3.1 The associated projective category; 2.3.2  
 Proposition (The projective congruence of vector spaces)  
 2.3.3 Projective spaces and projective maps

---

## Sommario/riassunto

In this book we want to explore aspects of coherence in homological  
 algebra, that already appear in the classical situation of abelian groups  
 or abelian categories. Lattices of subobjects are shown to play an  
 important role in the study of homological systems, from simple chain  
 complexes to all the structures that give rise to spectral sequences. A  
 parallel role is played by semigroups of endorelations. These links rest  
 on the fact that many such systems, but not all of them, live in  
 distributive sublattices of the modular lattices of subobjects of the  
 system. The property of distributivity al

---