

1. Record Nr.	UNINA9910151932703321
Autore	Bockle Gebhard
Titolo	Cohomological Theory of Crystals over Function Fields [[electronic resource] /] / Gebhard Bockle, Richard Pink
Pubbl/distr/stampa	Zuerich, Switzerland, : European Mathematical Society Publishing House, 2009
ISBN	3-03719-574-6
Descrizione fisica	1 online resource (195 pages)
Collana	EMS Tracts in Mathematics (ETM) ; 9
Classificazione	11-xx14-xx
Soggetti	Analytic number theory Number theory Algebraic geometry
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Sommario/riassunto	<p>This book develops a new cohomological theory for schemes in positive characteristic <math>p</math> and it applies this theory to give a purely algebraic proof of a conjecture of Goss on the rationality of certain L-functions arising in the arithmetic of function fields. These L-functions are power series over a certain ring <math>A</math>, associated to any family of Drinfeld <math>A</math>-modules or, more generally, of <math>A</math>-motives on a variety of finite type over the finite field <math>F_p</math>. By analogy to the Weil conjecture, Goss conjectured that these L-functions are in fact rational functions. In 1996 Taguchi and Wan gave a first proof of Goss's conjecture by analytic methods à la Dwork. The present text introduces <math>A</math>-crystals, which can be viewed as generalizations of families of <math>A</math>-motives, and studies their cohomology. While <math>A</math>-crystals are defined in terms of coherent sheaves together with a Frobenius map, in many ways they actually behave like constructible étale sheaves. A central result is a Lefschetz trace formula for L-functions of <math>A</math>-crystals, from which the rationality of these L-functions is immediate. Beyond its application to Goss's L-functions, the theory of <math>A</math>-crystals is closely related to the work of Emerton and Kisin on unit root <math>F</math>-crystals, and it is essential in an Eichler-Shimura type isomorphism for Drinfeld modular forms as constructed by the first author. The book is intended for researchers</p>

and advanced graduate students interested in the arithmetic of function fields and/or cohomology theories for varieties in positive characteristic. It assumes a good working knowledge in algebraic geometry as well as familiarity with homological algebra and derived categories, as provided by standard textbooks. Beyond that the presentation is largely self-contained.

---