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Titolo	Noncommutative Geometry and Physics: Renormalisation, Motives, Index Theory [[electronic resource] /] / Alan L. Carey
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Descrizione fisica	1 online resource (280 pages)
Collana	ESI Lectures in Mathematics and Physics (ESI)
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Soggetti	Calculus & mathematical analysis Global analysis, analysis on manifolds Number theory Functional analysis Quantum theory
Lingua di pubblicazione	Inglese
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Nota di contenuto	Notes on Feynman integrals and renormalization / Christoph Bergbauer -- Introduction to motives / Sujatha Ramdorai, Jorge Plazas, Matilde Marcolli -- A short survey on pre-Lie algebras / Dominique Manchon -- Divergent multiple sums and integrals with constraints: a comparative study / Sylvie Paycha -- Spectral triples: examples and index theory / Alan L. Carey, John Phillips, Adam Rennie.
Sommario/riassunto	This collection of expository articles grew out of the workshop "Number Theory and Physics" held in March 2009 at the The Erwin Schrodinger International Institute for Mathematical Physics, Vienna. The common theme of the articles is the influence of ideas from noncommutative geometry (NCG) on subjects ranging from number theory to Lie algebras, index theory, and mathematical physics. Matilde Marcolli's article gives a survey of relevant aspects of NCG in number theory, building on an introduction to motives for beginners by Jorge Plazas and Sujatha Ramdorai. A mildly unconventional view of index theory from the viewpoint of NCG is described in the article by Alan Carey, John Phillips and Adam Rennie. As developed by Alain Connes and Dirk Kreimer, NCG also provides insight into novel algebraic

structures underlying many analytic aspects of quantum field theory. Dominique Manchon's article on pre-Lie algebras fits into this developing research area. This interplay of algebraic and analytic techniques also appears in the articles by Christoph Bergbauer, who introduces renormalisation theory and Feynman diagram methods, and Sylvie Paycha, who focuses on relations between renormalisation and zeta function techniques.