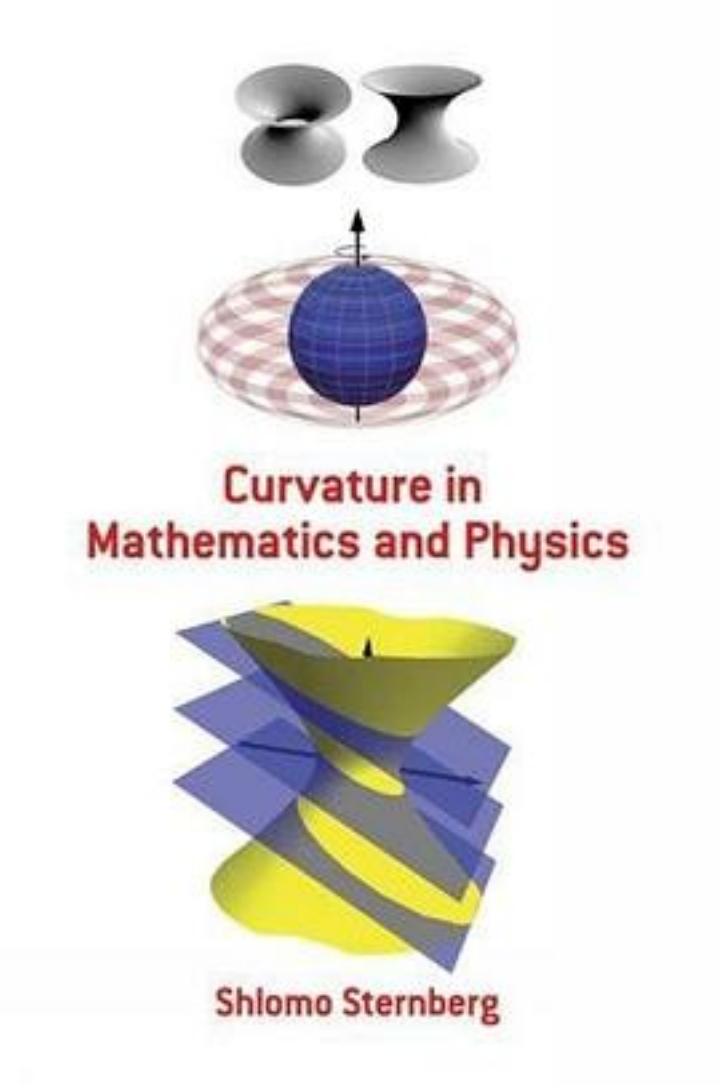
Curvature in Mathematics and Physics



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This original text for courses in differential geometry is geared toward advanced undergraduate and graduate majors in math and physics. Based on an advanced class taught by a world-renowned mathematician for more than fifty years, the treatment introduces semi-Riemannian geometry and its principal physical application, Einstein's theory of general relativity, using the Cartan exterior calculus as a principal tool.

Starting with an introduction to the various curvatures associated to a hypersurface embedded in Euclidean space, the text advances to a brief review of the differential and integral calculus on manifolds. A discussion of the fundamental notions of linear connections and their curvatures follows, along with considerations of Levi-Civita's theorem, bi-invariant metrics on a Lie group, Cartan calculations, Gauss's lemma, and variational formulas. Additional topics include the Hopf-Rinow, Myer's, and Frobenius theorems; special and general relativity; connections on principal and associated bundles; the star operator; superconnections; semi-Riemannian submersions; and Petrov types. Prerequisites include linear algebra and advanced calculus, preferably in the language of differential forms.

作者介绍:

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评论

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