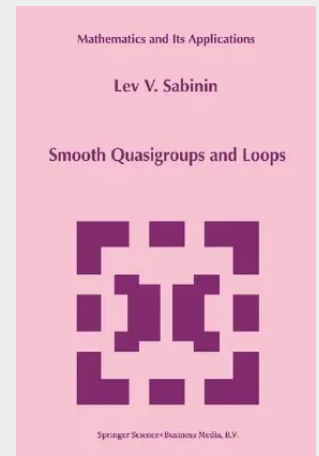


## Smooth Quasigroups and Loops

During the last twenty-five years quite remarkable relations between nonassociative algebra and differential geometry have been discovered in our work. Such exotic structures of algebra as quasigroups and loops were obtained from purely geometric structures such as affinely connected spaces. The notion of module was introduced as a fundamental algebraic invariant of differential geometry. For any space with an affine connection loopuscular, modular and geomodular structures (partial smooth algebras of a special kind) were introduced and studied. As it happened, the natural geomodular structure of an affinely connected space allows us to reconstruct this space in a unique way. Moreover, any smoothly abstractly given geomodular structure generates in a unique manner an affinely connected space with the natural geomodular structure isomorphic to the initial one. The above said means that any affinely connected (in particular, Riemannian) space can be treated as a purely algebraic structure equipped with smoothness. Numerous habitual geometric properties may be expressed in the language of geomodular structures by means of algebraic identities, etc. Our treatment has led us to the purely algebraic concept of affinely connected (in particular, Riemannian) spaces; for example, one can consider a discrete, or, even, finite space with affine connection (in the form of geomodular structure) which can be used in the old problem of discrete space-time in relativity, essential for the quantum space-time theory.

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