

## Positivstellensätze for semirings

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Suppose  $A$  is a commutative unital real algebra. If  $C$  is an Archimedean quadratic module or a module of an Archimedean semiring (preprime), then

$$C^\dagger = \{a \in A : a + \varepsilon 1 \in C \text{ for all } \varepsilon > 0\}$$

is an (Archimedean) preordering. This allows one to give simple unified approaches to the Archimedean Positivstellensätze for quadratic modules *and* semirings.

This talk deals with denominator-free Positivstellensätze for semirings. A number of results, examples, and notions are developed. They concern the Archimedean case as well as cylindrical extensions of algebras with Archimedean semirings.

The talk is based on joint work (Math. Ann. 2023) with Matthias Schötz.