

“COLOMBEAU ALGEBRAS. ”

EDUARD NIGSCH

“In Schwartz’ theory of distributions there is no possibility to consistently define the product of arbitrary distributions, or other nonlinear operations on them which are necessary for the formulation e.g. of nonlinear PDEs involving singularities. One possibility to overcome this problem is to embed distributions into algebras of generalized functions. Colombeau algebras represent a widely studied class of such algebras. However, compared to classical distribution theory these algebras have several inconvenient structural drawbacks.

In my talk I will explain some challenges in this field and the recent progress which was possible by formulating Colombeau algebras using concepts of Schwartz’ theory of vector-valued distributions. This way, various distinct constructions of Colombeau algebras which appear in the literature can be unified and structured to a good extent. Moreover, this formulation places Colombeau algebras closer to classical functional analytic notions and also makes possible a geometric formulation on manifolds.”