

Seminarankündigung

Deformationsquantisierung

Am 12. 3. 2021 spricht um 14 Uhr c.t.

<https://bbb.durates.net/b/ste-2va-uez>

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Some approaches to the differential geometry of singular spaces

Several objects that appear naturally in differential geometry - the zero set of a smooth function, or the quotient of a manifold by a Lie group action, for example - may not be smooth. But we may still want to study their differential geometry, to the extent possible, in a way that generalizes usual concepts - the zero set of some functions, and the quotient of some group actions are smooth, we want to generalize those.

A few possible approaches are to take inspiration from algebraic geometry and study the object via an appropriately defined algebra, or sheaf, of smooth functions; or maybe to decompose the object into smaller pieces that are themselves smooth manifolds and fit together nicely; or to describe the object in kind of a “generators and relations” presentation, where the generators and the relations are smooth, and work with the presentation instead. These lead us to the study of differentiable spaces, stratified spaces, and Lie groupoids (which give presentations for differentiable stacks).

In this introductory talk we will see the definitions of these concepts, some examples in which they can be of use, and some classes of singular spaces which are quite well behaved and have good descriptions in all three pictures. I will also try to mention a panoramic view of other approaches to singular spaces, such as diffeological spaces, or noncommutative geometric techniques, and how they relate to the examples presented.

gez. Stefan Waldmann