Ind-varieties and Ind-groups: basic concepts and examples.

Abstract:

In 1966 Shafarevich introduced the notion of infinite dimensional algebraic group, shortly ind-group. His main application was the automorphism group of affine $n$ – space $A^n$ for which he claimed some interesting properties. Recently, jointly with J.-Ph. Furter we showed that the automorphism group of any finitely generated (general) algebra has a natural structure of an ind-group, and we further developed the theory.

It turned out that some properties well-know for algebraic groups carry over to ind-groups, but others do not. E.g. every ind-group has a Lie algebra, but the relation between the group and its Lie algebra still remains unclear. As another by-product of this theory we get new interpretations and a better understanding of some classical results, together with short and transparent proofs.

An interesting test case is $\text{Aut}(A^2)$, the automorphism group of affine 2-space, because this group is the amalgamated product of two closed subgroups which implies a number of remarkable properties. E.g. a conjugacy class of an element $g \in \text{Aut}(A^2)$ is closed if and only if $g$ is semi-simple, a result well-known for algebraic groups. A generalization of this to higher dimensions would have very strong and deep consequences, e.g. for the linearization problem.

Note: There will be a pre-talk for graduate students from 2:30-3:00. The speaker has kindly accepted to tell our graduate students what an ind-group is. The regular talk will begin at 3:00.

Host: Nolan Wallach

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2:30 PM
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