Lie theory for algebroid 2-representations

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Resumo

This talk will discuss Lie algebroids (i.e. geometric structures that unify Lie algebras, regular foliations, Poisson structures, among others) and their representations. Geometrically, a representation of a Lie algebroid is a vector bundle equipped with a flat algebroid connection. For integrable Lie algebroids, i.e. those coming from Lie groupoids, representations can be integrated to groupoid representations. This construction is an extension of the relation between flat connections and parallel transport. We are going to see how this can be done for a more general notion of representation, that of a 2-representation of a Lie algebroid on a 2-term complex of vector bundles, e.g. the adjoint or the coadjoint representations of a Lie algebroid. We will see that any 2-representation integrates to a 2-functor, which plays the role of a higher holonomy of a 2-connection. Then, we will show that the associated semi-direct product is a Lie 2-groupoid, which after truncation, yields to a new construction of topological $\mathcal{VB}$-groupoids "integrating"2-term representations up to homotopy. This is a joint work with Olivier Brahic.