

## Ecole Doctorale des Sciences Fondamentales

**Title of the thesis: Parameter dependent pseudodifferential calculus on groupoids and Asymptotic expansion of the resolvent on singular spaces.**

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**Summary :**

**Singular spaces (manifolds with corners possibly provided with extra structures on their boundary faces) form an important class of objects onto which the analysis of pseudodifferential operators can be developed through their desingularizations using groupoids.**

**On a smooth manifold (compact, without boundary), the resolvent of elliptic pseudo differential operators constitute a class of operators living in an extended calculus, and the asymptotic expansion of their kernels, when the parameter goes to infinity, leads to nice applications in analysis and geometry. On singular spaces, excepted for a few simple cases, the resolvents as well as their asymptotic expansion are far from understood.**

**The purpose of this PhD is to develop first a parameter dependent pseudodifferential calculus on groupoids that contains the resolvents of elliptic pseudodifferential operators in this framework. Then, the next task will be to obtain asymptotic expansions of these resolvents. These results will be finally applied to concrete interesting examples of singular spaces, namely stratified spaces.**

**Prerequisites for this PhD are a good skill in Fourier analysis, differential geometry and Hilbert spaces. Also, knowledge in functional analysis will be helpful.**