

# Séminaire d'Algèbre, Topologie et Géométrie

## Jeudi 6 mai à 15h15

### Salle II

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**Titre :** *Local order 1 Vassiliev type invariants of maps between oriented 3-manifolds*

**Résumé :** Local order 1 invariants are those whose increments in generic one-parameter families of smooth maps are defined by local degenerations in the families. Unlike the case of knots in  $\mathbf{R}^3$ , which have no non-trivial order 1 Vassiliev invariants, other dimensions are richer. For example, according to Arnold, regular planar curves have 3 independent invariants of this kind,  $J^\pm$  and strangeness. For maps of surfaces either to  $\mathbf{R}^2$  or to  $\mathbf{R}^3$ , the spaces of local order 1 invariants are also of rank 3. Unfortunately, these nearly exhaust all cases studied so far.

The talk will concentrate on maps of oriented 3-manifolds to  $\mathbf{R}^3$ , and their local invariants in terms of the geometry of the critical value set. It turns out that this time the integer-valued invariant space has rank 8. There are 5 obvious invariants counting the numbers of point singularities of the critical value set, that is, its triple points, swallowtails and intersections of cuspidal edges with smooth sheets (signed in the last two cases). The meaning of the remaining 3 invariants will be explained.

I will also list the mod 2 classification. It contains 12 invariants, some of which are still to be integrated.