# UNIVERSAL LINK INVARIANTS VIA CONFIGURATION SPACES

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Coloured Jones and Alexander polynomials are quantum invariants originating in representation theory. They are building blocks for 3-manifold quantum invariants, and their geometric information is an important open problem in quantum topology.

We will describe them from a unified topological viewpoint. For a fixed level $\mathcal{N}$, we define new link invariants: "$\mathcal{N}^{th}$ Unified Jones invariant" and "$\mathcal{N}^{th}$ Unified Alexander invariant". They globalise topologically all coloured Jones and all ADO link polynomials with (multi-)colours bounded by $\mathcal{N}$. This shows that all coloured Jones and coloured Alexander polynomials at bounded (multi-)level are encoded by the same Lagrangian intersections in a fixed configuration space.

Then, asymptotically, we define geometrically a *universal ADO link invariant* and *universal Jones link invariant*. The question of providing a universal invariant recovering all ADO link polynomials was an open problem. A parallel question about semi-simple knot invariants is the subject of Habiro's famous universal invariant. Our universal Jones invariant recovers all coloured Jones polynomials, providing a new semi-simple universal link invariant. The first non semi-simple universal link invariant that we construct unifies geometrically all ADO link invariants.