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*The path loop fibration in symplectic topology*

The well known Morse homology uses the critical points of a Morse function and 0-dimensional spaces of flow lines to recover the homology of the ambient manifold. I will explain how this complex can be enriched to take higher dimensional moduli spaces into account. As expected, the resulting algebraic invariant is a refinement over homology, and consists in the Leray–Serre spectral sequence associated to the path-loop fibration. This construction turns out to have interesting applications and ramifications in the symplectic setting, that will be discussed as well.