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Mirror symmetry for Higgs bundles and the fundamental lemma

The fundamental lemma is an identity of integrals central to the Langlands programme. Despite its ostensibly combinatorial nature, it resisted all direct efforts to verify it, until Ngô finally proved it in 2008. One of the unexpected features of Ngô's argument, was the important role played by the moduli space of Higgs bundles. His proof infers the fundamental lemma from a statement about the cohomology of moduli spaces of Higgs bundles, called geometric stabilisation.

In this talk I'll discuss a new perspective on geometric stabilisation, provided by p-adic integration. We will see that there exists a close philosophical link between mirror symmetry for moduli spaces of Higgs bundles (à la Hausel-Thaddeus) and the fundamental lemma. This is joint work with Wyss and Ziegler.