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Counting l -adic local systems over a curve over a finite field

Abstract : In 1981, Drinfeld enumerated the number of irreducible l -adic local systems of rank two on a projective smooth curve fixed by the Frobenius endomorphism. Interestingly, this number looks like the number of points on a variety over a finite field. Deligne proposed conjectures to extend and comprehend Drinfeld's result. By the Langlands correspondence, it is equivalent to count certain cuspidal automorphic representations over a function field. In this talk, I will present some counting results where we connect counting to the number of stable Higgs bundles using Arthur's non-invariant trace formula.