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### On the geometry of character varieties

I will describe how we may count the number of points over finite fields for certain character varieties, parameterizing representations of the fundamental group of a Riemann surface into  $GL_n$ . The answer involves in an essential way the Macdonald polynomials of combinatorics. I will discuss the geometric implications of this computation and the conjectures on the mixed Hodge numbers of the character varieties it has led to. This is joint work with T. Hausel and E. Letellier