Seminar/Talk

Moments of families of quadratic L-functions over function fields via homotopy theory

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Host: Tim Browning

This is a report of joint work with Bergström-Diaconu-Westerland and Miller-Patzt-Randal-Williams. Based on random matrix theory, Conrey-Farmer-Keating-Rubinstein-Snaith have conjectured precise asymptotics for moments of families of quadratic L-functions over number fields. There is an extremely similar function field analogue, worked out by Andrade-Keating. I will explain that one can relate this problem to understanding the homology of the braid group with symplectic coefficients. With Bergström-Diaconu-Westerland we compute the stable homology groups of the braid groups with these coefficients, together with their structure as Galois representations. This may be thought of as a hyperelliptic analogue of the Mumford conjecture (Madsen-Weiss theorem) with twisted coefficients. We moreover show that the answer matches the number-theoretic predictions. With Miller-Patzt-Randal-Williams we prove an improved range for homological stability with these coefficients. Together, these results imply the conjectured asymptotics for all moments in the function field case, for all sufficiently large (but fixed) q.

Thursday, November 30, 2023 01:00pm - 03:00pm
Heinzel Seminar Room (I21.EG.101), Office Building West, ISTA

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