
THE WEIZMANN INSTITUTE OF SCIENCE
FACULTY OF MATHEMATICS AND COMPUTER SCIENCE
Algebraic Geometry and Representation Theory Seminar

on Friday, Jun 05, 2020 at 16:30

Zoom meeting: <https://weizmann.zoom.us/j/98304397425>
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Algebraic structures on automorphic L-functions

Abstract:

Consider the function field \mathbb{F}_q of a smooth curve over \mathbb{F}_q , with $q \neq 2$.

L-functions of automorphic representations of $\mathrm{GL}(2)$ over \mathbb{F}_q are important objects for studying the arithmetic properties of the field \mathbb{F}_q . Unfortunately, they can be defined in two different ways: one by Godement-Jacquet, and one by Jacquet-Langlands. Classically, one shows that the resulting L-functions coincide using a complicated computation.

I will present a conceptual proof that the two families coincide, by categorifying the question. This correspondence will necessitate comparing two very different sets of data, which will have significant implications for the representation theory of $\mathrm{GL}(2)$. In particular, we will obtain an exotic symmetric monoidal structure on the category of representations of $\mathrm{GL}(2)$.

It turns out that an appropriate space of automorphic functions is a commutative algebra with respect to this symmetric monoidal structure. I will outline this construction, and show how it can be used to construct a category of automorphic representations.

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