

NUMBER THEORY

minicourse

ARITHMETIC OF FUNCTION FIELDS

SPEAKER: Maxim Mornev (ETH Zürich)

DATE & TIME: January 20, 2020 // 15:00 - 17:00
January 21-23, 2020 // 10:00 - 12:00

VENUE: Aula 420, Departamento de Matemáticas, UAM

ORGANISER: UAM - ICMAT

ABSTRACT: Taelman discovered an analog of BSD conjecture for Drinfeld modules and proved it in the key case of the coefficient ring $F_q[t]$. In this lecture course I shall discuss an approach to his original result and the subsequent generalizations via shtuka cohomology. This leads to a rather conceptual proof of the conjecture and resonates well with equivariant Tamagawa number conjecture for motives.

The course can be naturally divided into three parts:

1. Statement of the conjecture and overview of the proof.
2. Shtukas, their cohomology and the relation to Drinfeld modules (1,5 lectures).
3. Regulator theory and the trace formula (1,5 lectures).

In the third part I shall discuss the key tool: Anderson's trace formula. This formula expresses the special values of Goss L-functions as determinants of various kind (e.g. Fredholm determinants of certain trace-class operators in Taelman's original proof).

