

Department of Mathematics, BGU

AGNT

On Wednesday, November 6, 2024

At 14:10 – 15:10

In 101-

Nadav Gropper (University of Haifa)

will talk about

TQFTs for pro- p Poincaré duality groups

Abstract: In the talk, I will discuss the Turner-Turaev formalism for unoriented Topological Quantum Field Theory (TQFT). Building upon this formalism, I will introduce an analogous version for $(d+1)$ -dimensional TQFT for pro- p Poincaré duality groups. In the case of $d = 1$, this enables us to study cobordisms and TQFTs for both the maximal pro- p quotient of absolute Galois groups of p -adic fields and $\pi_1(X)^{\wedge p}$, the pro- p completions of fundamental groups of surfaces. This generalisation gives a framework for arithmetic TQFTs and strengthens the analogies within arithmetic topology, which relates p -adic fields to surfaces (oriented mod p^r). I will explain the classification of TQFTs for the $(1+1)$ -dimensional case, in terms of Frobenius algebras with some extra structure.

If time permits, I will explain how we define a Dijkgraaf-Witten like theory, to get formulas for counting G -covers of X , where X is either a surface, or a p -adic field, and G is a p -group (these formulas are similar to the ones given by Mednykh for surfaces using TQFTs, and by Masakazu Yamagishi using a more

algebraic approach). I will also try to outline how we plan to also get similar formulas for $\text{Hom}(\pi_1(X)^p, G)$, where $G = \text{GL}_n(k)$ for $k = \mathbb{F}_{p^r}$ or $\mathbb{Z}/p^r\mathbb{Z}$.

The talk is based on joint work with Oren Ben-Bassat.