



QUANTUM UNIVERSE LECTURES

Christoph Schweigert, Tobias Dyckerhoff, Paul Wedrich (U Hamburg)

“Correlators, topological field theory and categorification”

13, 20 and 27 January 2023 at 14.30h

DESY, building 2a, seminar room 2

and via Zoom: <https://uni-hamburg.zoom.us/j/92293543262>
(Meeting ID: 922 9354 3262, Passcode: 97540703)

Abstracts:

Stringnets for CFT correlators: We show how recent progress in quantum topology allows for conceptual and simple proofs of the existence of consistent systems of correlators of two-dimensional conformal field theories. We show that all correlators naturally factorize through spaces constructed from defect data. This points to a new general conceptual role for defects in quantum field theories.

Categorified state sums and the topological A-model: We begin with an elementary mathematical perspective on state sum constructions for correlators of the most basic kinds of 2D topological field theories. Taking this as a starting point, we will see how a categorified variant of these constructions somewhat surprisingly leads to a description of 2D Fukaya categories (in string theoretic terms, these are categories of branes in the topological A-model introduced by Witten). Time permitting, we will say a few general words about this novel type of categorification and what we would like to do with it.

Categorification in quantum topology: I will start by giving an introduction to the framework of "categorification" and outline how it is used for the construction and study of topological field theories as a kind of dual to the process of dimensional reduction. After situating some examples that we have met previously, I will present a sequence of increasingly sophisticated categorifications of quantum invariants of knots. As an application, we obtain a new invariant of smooth 4D manifolds from Khovanov's categorification of the Jones polynomial, akin to the string net spaces from the first talk of this series, but with all dimensions doubled.

Registration on Geventis:

<https://www.geventis.uni-hamburg.de/course?course=7983970120265348904>
