MAT558: SEMINAR ON TENSOR CATEGORIES

What?

The philosophy is: Categories generalize (categorify) sets; categories with additional structure should categorify sets with additional structure. In particular, the notion of a tensor category and their categorical representations can be seen as a categorification of rings and algebras and their representations, making the rich story of rings and algebras even more interesting. The purpose of this seminar is to understand how this works precisely.

The seminar follows the book [EGNO15].

Who?

Master students and upwards interested in a mixture of category theory, algebra and representation theory.

Where and when?

- ▶ Time and date.
  - Every Monday from 15:15–17:00.
  - Room Y27H28, University Zurich, Institute of Mathematics.
  - First meeting: 19.Feb.2018.
- ▶ Preliminary meeting: 05.Feb.2018, 15:15–17:00, room Y27H28.
- ▶ Website http://www.dtubbenhauer.com/seminar-tensor-2018.html

Preliminary Schedule.

- ▷ Abelian categories, basic notions, properties and examples & functors between abelian categories. (19.Feb.2018)
- ▷ Monoidal categories and functors, basic properties and examples. (26.Feb.2018)
- ▷ Coherence and monoidal categories. (05.Mar.2018)
- ▷ Categorical groups and categorical actions. (12.Mar.2018)
- ▷ $\mathbb{Z}_+$-rings and their Perron–Frobenius dimensions. (19.Mar.2018)
- ▷ $\mathbb{Z}_+$-rings and their representations. (26.Mar.2018)
- ▷ Tensor categories and tensor functors. (09.Apr.2018)
- ▷ Traces and tensor subcategories (16.Apr.2018)
- ▷ Grothendieck rings and Perron–Frobenius dimensions of tensor categories. (23.Apr.2018)
- ▷ Finite tensor categories and Perron–Frobenius revisited. (30.Apr.2018)
- ▷ Module categories – basic constructions. (07.May.2018)
- ▷ Module categories and $\mathbb{Z}_+$-modules. (14.May.2018)

References

[EGNO15] P. Etingof, S. Gelaki, D. Nikshych, V. Ostrik. *Tensor categories*. Mathematical Surveys and Monographs, **205**. American Mathematical Society, Providence, RI, 2015.

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