

## MAT562.1: SEMINAR ON 2D TQFTS

### What?

The philosophy is: Topology is interesting, but hard. So we want to translate topology into (way easier) algebra. Preferable into linear algebra. This is the main idea behind functors, which should be thought of as providing a way to turn questions in topology into questions in (linear) algebra. The point of this seminar is to understand how this works in the case of a 2D TQFT, where a beautiful classification in terms of algebra is possible.

The seminar follows the book [Kock04].

### Who?

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

### Where and when?

- ▶ Time and date.
  - Every Monday from 13:15–15:00.
  - Room Y27H28, University Zurich, Institute of Mathematics.
  - First meeting: 24.Sep.2018.
- ▶ Preliminary meeting: 10.Sep.2018, 13:15–15:00, room Y27H28.
- ▶ Website <http://www.dtubbenhauer.com/seminar-frob-2018.html>

### Preliminary Schedule.

- ▷ Prologue: Vocabulary from category theory. (24.Sep.2018)
- ▷ Cobordisms topologically I. (01.Oct.2018)
- ▷ Cobordisms topologically II. (08.Oct.2018)
- ▷ Generators for two-dimensional cobordisms. (15.Oct.2018)
- ▷ Relations for two-dimensional cobordisms. (22.Oct.2018)
- ▷ Frobenius algebras. (29.Oct.2018)
- ▷ Frobenius algebras diagrammatically I. (05.Nov.2018)
- ▷ Frobenius algebras diagrammatically II. (12.Nov.2018)
- ▷ Free. (19.Nov.2018 & 26.Nov.2018 & 03.Dec.2018)
- ▷ From Frobenius algebras to TQFTs. (10.Dec.2018)
- ▷ Epilogue: Finite ordinals and cardinals diagrammatically. (17.Dec.2018)

### REFERENCES

[Kock04] J. Kock. *Frobenius algebras and 2D topological quantum field theories*. London Mathematical Society Student Texts, **59**. Cambridge University Press, Cambridge, 2004.

DANIEL TUBBENHAUER: INSTITUT FÜR MATHEMATIK, UNIVERSITÄT ZÜRICH, WINTERTHURERSTRASSE 190, CAMPUS IRCHEL, OFFICE Y27J32, CH-8057 ZÜRICH, SWITZERLAND, [WWW.DTUBBENHAUER.COM](http://WWW.DTUBBENHAUER.COM)  
E-mail address: [daniel.tubbenhauer@math.uzh.ch](mailto:daniel.tubbenhauer@math.uzh.ch)