

## GÖTTINGEN-WÜRZBURG GEOMETRY DAY

15TH OF MARCH 2022, 9:30AM TO 4PM

HYBRID, ROOM SE30 IN WÜRZBURG AND ZOOM

This is the first of a planned series of meetings that will be organised each semester by the Geometry group in Würzburg and the Higher Structures group in Göttingen. This first meeting takes place online, with four talks and time for discussions. The participants in Würzburg have the option to attend the talks in the room SE30 where the talks by the speakers in Würzburg will be given at the blackboard, and some of the participants in Göttingen plan to join the meeting together as well.

Please let your local organisers know if you plan to attend the meeting in presence in your city; due to Covid-restrictions the number of places is limited. Please contact us as well if you would like to have the zoom link for the event.

### SCHEDULE AND PROGRAMME

**9:30 to 10:15am** Leonid Ryvkin (Göttingen)

Title: **Q-structures on the iterated tangent bundle**

Abstract: The iterated tangent bundle  $(T[1]^n M)$  is a multigraded manifold and carries  $n$  commuting homological vector fields. In this talk we will try to understand the Lie- $n$  structures corresponding to these.

Work in progress with Du Li, Rui Fernandes, Arne Wessel, Chenchang Zhu.

**10:45 to 11:30am** Gregor Schaumann (Würzburg)

Title: **Flat bundles and topological quantum field theories**

Abstract: The moduli space of flat gauge group bundles is an important invariant of manifolds that can be studied via topological quantum field theories. In this talk I attempt to generalize the concept and to show how it can provide connections between mathematical approaches to TQFTs: State sum models, factorization algebras and the use of the cobordism hypothesis. All this is treated in the case of 2d modular functors. This is build on joint work with Christoph Schweigert and Jürgen Fuchs.

**11:30 am to 1pm** Lunch break.

**1 to 1:45pm** Speed-networking sessions, over zoom only.

**2 to 2:45pm** Miquel Cueca (Göttingen)

Title: **Integration of Courant algebroids**

Abstract: I will give concrete examples of shifted symplectic higher Lie groupoids that integrate some particular Courant algebroids. This is joint work with Chenchang Zhu and Stefano Ronchi.

**3:15pm to 4pm** Francesco Cattafi (Würzburg)

Title: **Morita equivalence and integrability of geometric structures**

Abstract: I will start this talk by revising the classical notion of Morita equivalence between Lie groupoids. Inspired by the definition of symplectic Morita equivalence between symplectic groupoids, I will introduce a notion of “Pfaffian Morita equivalence” between Lie groupoids endowed with a special multiplicative structure. I will then explain how these “Pfaffian” structures on

groupoids are related with several well-known geometric structures on manifolds, and discuss the interplay of Morita equivalence with the integrability/flatness of these geometric structures. This is joint work (in progress) with Luca Accornero.

**5 to 6pm** Social event, over zoom only.

## ORGANIZERS

Francesco Cattafi (Würzburg)  
Madeleine Jotz Lean (Würzburg)  
Chenchang Zhu (Göttingen)