

Fakultät für Mathematik, Informatik und Naturwissenschaften

## Kolloquium über Reine Mathematik

### Einladung zu einem Vortrag

# Dienstag, 12. Dezember 2023

### 17 Uhr, Geom H4

# Prof. Ralf Köhl (Universität Kiel)

#### Kostant convexity of Kac-Moody groups. And a guide towards treating topological Kac-Moody groups similarly to semisimple Lie groups

Abstract:

Topological Kac-Moody groups share very many properties of semisimple Lie groups. In my talk I will investige semisimple Lie groups as colimits of amalgams "of finite type" of rank-1 and rank-2 Lie subgroups, and then just define topological Kac-Moody groups as colimits of amalgams "of arbitrary type" of rank-1 and rank-2 Lie subgroups.

The justification of this approach lies in the theory of buildings and twin buildings and goes back to theorems by Tits (1974) and Abramenko-Mühlherr (1997).

This leads to the so-called Kac-Peterson topology on Kac-Moody groups which has striking similarities to the Lie topology: the Iwasawa decomposition G = UAK is a homeomorphism, G is homotopy-equivalent to K, the big cell B\_-B\_+ is open and homeomorphic to U\_- \times T \times U\_+, the coset space G/K carries the structure of an axiomatic symmetric space in the sense of Loos, etc.

In my talk I will investigate the fundamental group of a topological Kac-Moody group G and in passing provide a systematic recipe for computing the fundamental groups of split real semisimple Lie groups. I will conclude by having a closer look at Kostant's convexity theorem from 1973 recast for Kac-Moody groups.

> Vor dem Vortrag (ab 16.30 Uhr) stehen im Foyer vor Hörsaal H4 Kaffee und Tee bereit.