

A U S H A N G

FREIE UNIVERSITÄT BERLIN

Fachbereich Mathematik und Informatik

Promotionsbüro, Arnimallee 14, 14195 Berlin

D I S P U T A T I O N

Dienstag, 24. Juni 2025, 16:15 Uhr

Ort: Seminarraum 115

(Fachbereich Mathematik und Informatik, Arnimallee 3, 14195 Berlin)

Disputation über die Doktorarbeit von

Marwan Benyoussef

Thema der Dissertation:

Character Varieties for Seifert Groups and Higgs Bundles over Orbifolds

Thema der Disputation:

Spectral correspondence in higher dimensions

Die Arbeit wurde unter der Betreuung von **Prof. Dr. A. Schmitt** durchgeführt.

Abstract: Guided by the non-abelian Hodge theorem, we explore the link between Higgs bundles and spectral geometry on a smooth proper algebraic variety X of dimension d . We describe the Hitchin fibration, mapping Higgs bundles on X to a base space A of spectral data. For curves ($d = 1$), generic fibers of the Hitchin map are abelian varieties (line bundles on spectral curves), yielding a celebrated completely integrable system.

In higher dimensions, the geometry is governed by a universal spectral cover: Higgs data corresponds to a tuple of commuting endomorphisms and the invariant-theoretic problem is resolved by the joint spectrum of these operators, giving a universal spectral data map. Combining this with the Weyl embedding, we describe the Hitchin map intrinsically and construct spectral covers over X . These covers are not flat in general obstructing the surjectivity of the Hitchin map. Chen and Ngo overcome this for surfaces via Cohen-Macaulification of the spectral cover, recovering a geometric description of the generic fibers of the Hitchin map.

Die Disputation besteht aus dem o. g. Vortrag, danach der Vorstellung der Dissertation einschließlich jeweils anschließenden Aussprachen.

Interessierte werden hiermit herzlich eingeladen

Der Vorsitzende der Promotionskommission
Prof. Dr. A. Schmitt